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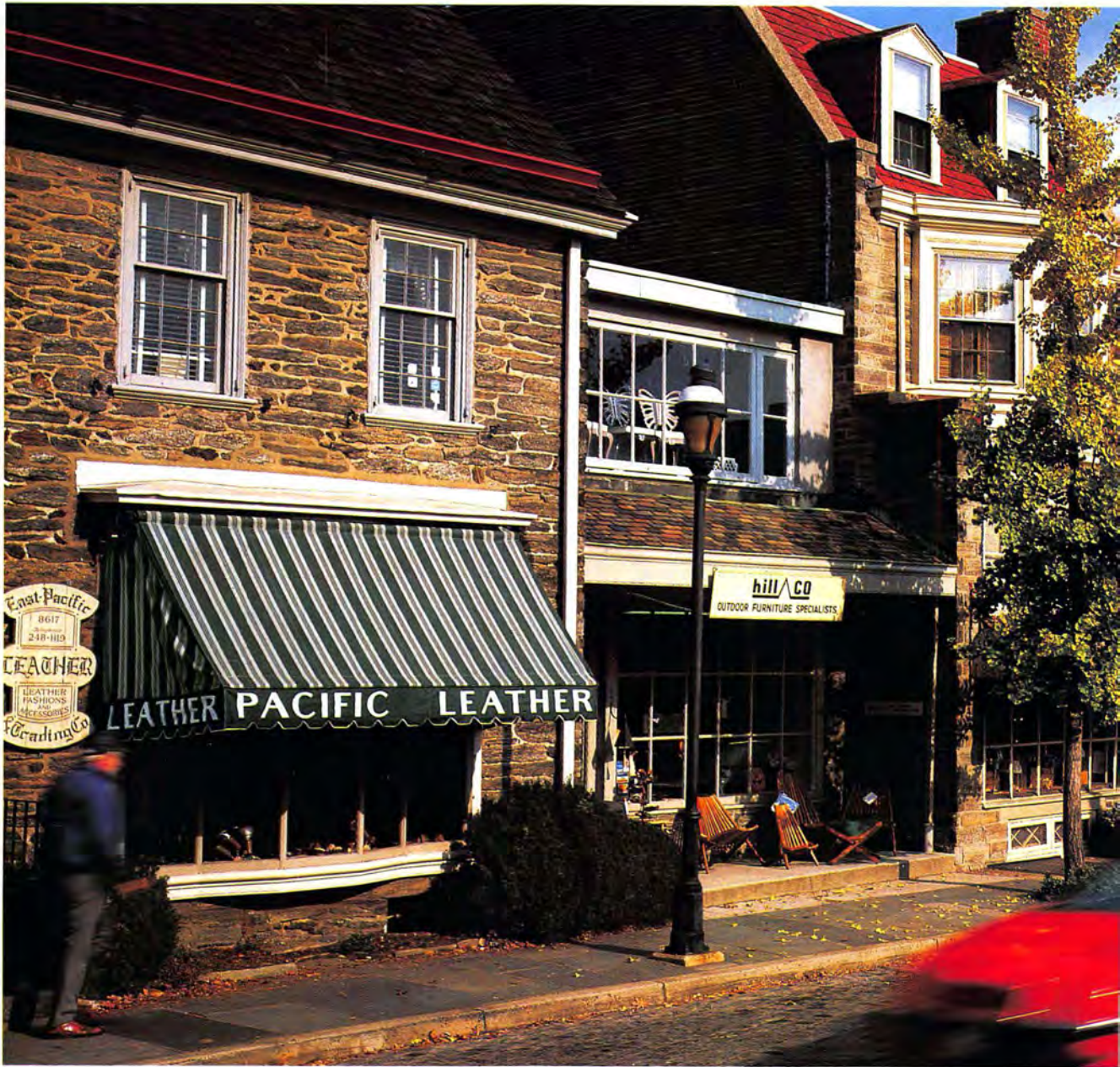
An industry first: six complete, major upgrades. Namely, Microsoft Excel, Word, PowerPoint®, Mail, Works and Microsoft Project. Each one is a precise response to users' needs, and all were introduced within the past year.

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ChartWizard in Microsoft® Excel 4.0, for example. And Toolbars in Word 5.1.

But we didn't just wait for ideas to come to us. We went looking, with field tests, focus groups, and our Usability Lab, where we watched Mac users at work. What did all that input produce?

This year,
we upgraded
six products.





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It's one-stop shopping
when you go for the Works.

MacUser

September 1993

Volume 9 Number 9

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Cover photo by Fred Stimson



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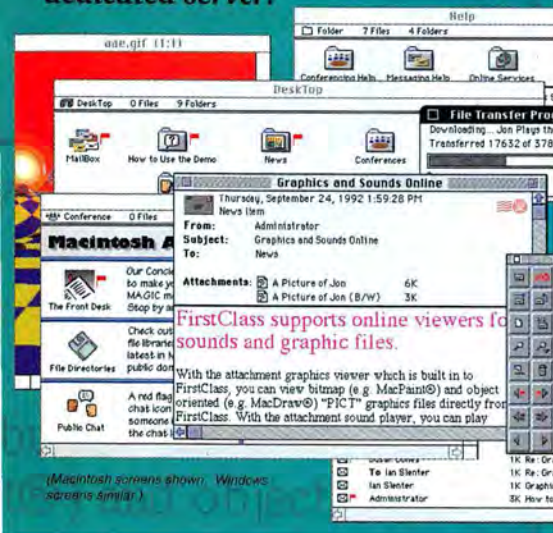
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About

MacUser

Net Results

If your Mac is hooked up to a printer, you are — like it or not — a network administrator. Given that, you may want to pay particular attention to two articles in this issue that are especially for people who maintain networks. One brings a fresh perspective to the vital topic of backing up your network (see "Building a Data Safety Net," page 208). The other presents a series of LocalTalk workgroup strategies (see "Simple Network Secrets," page 233).

No? You say you couldn't care less about networks? It's no skin off your nose if your router's gone off to Siberia? You just want your documents to print? If that's your attitude, then *MacUser* editor (and author of our two networking stories) Shelly Brisbin has some thoughts for you.

"Networking is interesting," Shelly insists, "and cool. It's the notion of looking at how people communicate that's exciting to me."

Well, it was networking that led Shelly to *MacUser*. She networked her way from desktop publisher to Mac consultant to systems administrator for the attorney general of Texas. And in retrospect, that was all just training for her current challenging position as *MacUser* network guru.

And an intensely practical education it all was. "Because of my affiliation as a Mac consultant to companies, I had access to many networks. I could test networking products for networking articles in real-life situations." Her consultant work also led her to a deep understanding of other people's jobs. To do that work, Shelly says, "you need to understand what people *do* with a computer. Who needs what; who has mission-critical responsibilities."

According to Shelly, we're asking a lot of networks these days. "We expect them to accommodate more and more users, to provide e-mail, and to support database sharing and workgroup serving." Fortunately, new networking tools are doing a good job of keeping up — albeit not as quickly as we'd like.

"The technology is growing and changing," Shelly says. "We're going to see new ways of connecting machines to each other, new protocols that enable cross-platform communication — and the advent of wireless computing."

These days, Shelly gets together informally with fellow *MacUser* editors Mark Bieler, Karen Ohlson, Stephan Somogyi, Sean Safreed, and John Rizzo to share ideas and investigate new network products and technologies. "We're really spoiled in terms of the neat things we have access to," Shelly says. "And the *MacUser* NetWorkShop is a state-of-the-art testing facility. I try to look at every piece of software in a real-life situation. It's a challenge every day." And, Shelly insists, it's *fun*.

— Nancy Groth



Associate editor Shelly Brisbin knows how to make networks fun.

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and black-and-white. The HP ScanJet IIP is an exceptional product. The scanner is just 16 inches long by 11 inches wide by 4 inches high.

WINNING COMBINATION

To test the HP ScanJet IIC, we used the same set of tests we used for our most recent color-scanner lab report. The results showed HP's new scanner to be the best in its class in both hardware and software. The ScanJet impresses from the moment you open the box. Other

scanners use a removable screw that locks the scan head for shipping, but HP uses a locking lever that's built into the scanner itself. There's no screw to lose, and the lever is so easy to use that you'll find yourself locking the scan head more often, thereby increasing its life span.

anner category.

ssed...



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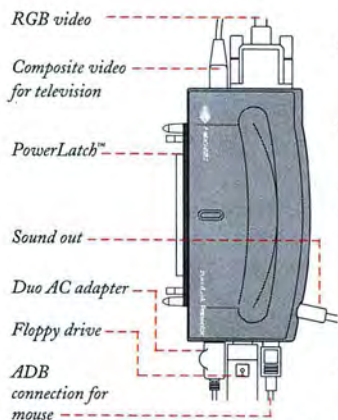


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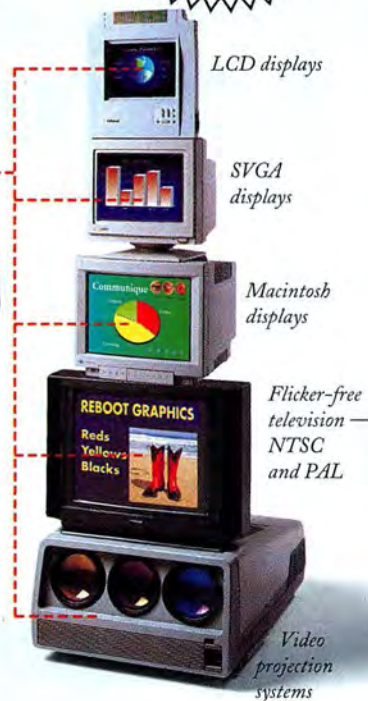
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LETTERS

Jaded palette? Lloyd Botway, of Nashville, Tennessee, has the solution: a utility that tells you the names of colors based on data taken from paint chips, wallpaper samples, and lipstick and nail-polish containers. "I just typed in three random numbers for red, green, and blue values, and the program displayed 'light blushing tawny autumn sunset peach.'" He calls his program Huephemisms. In case you don't get it, Lloyd thoughtfully adds, "This is a joke." Not for long . . .

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A Mac in Every Pot

I saw John Sculley on NBC's "Today" show, where he discussed President Clinton's economic policies. Well, if President Clinton looks after the American people the way Sculley looks after his customers, all I can say is, God save America!

Lou Winklemann
North Adelaide
South Australia
Australia

Double Trouble

Before he wrote his review of TimesTwo (June '93, page 57), Andy Ihnatko should have checked his facts relating to StuffIt SpaceSaver. In order to access files compressed with SpaceSaver, users do not need to "run the control-panel software," as Mr. Ihnatko states. In fact, we developed SpaceSaver so users can start up without extensions and still use their compressed files.

Also, he should have noted

that SpaceSaver offers one-step installation. We use our StuffIt Installer technology, which is known for its ease of use and speed.

As for Mr. Ihnatko's stating that compression utilities such as SpaceSaver are "complicated," I guess he forgot what he said in an earlier review ("AutoDoubler, More Disk Space, and SpaceSaver," May '93, page 57): "The SpaceSaver compression utility is noteworthy for its simplicity and flexibility."

David Schargel
President
Aladdin Systems
Watsonville, CA

I take exception to some statements regarding Fifth Generation Systems' AutoDoubler that Andy Ihnatko makes in his review of TimesTwo. Mr. Ihnatko wrote that AutoDoubler is complicated to install and maintain and that in order to access a compressed file, you must run the

control-panel software. Installing and configuring AD on my IIsi was simple. What is there to maintain? The Auto in AutoDoubler means just that. Compression and expansion are automatic. I do not remember the last time I had to access the AD control panel.

Charles Downs
Phoenix, AZ

A few words were, uh, compressed during the editing process. My original comments were that such software can be difficult to use and that special system extensions have to be running to access compressed files. Although using a SpaceSaver or AutoDoubled volume can be just as simple as using a TimesTwoed one, that's not always the case. (And here's a tip for future writers: When your readers call you Mr., you're in trouble.) — AI

Open Folder

This month, readers open fire on MacUser. Michael S. Schultz, of Dreieich-Sprenglingen, Germany, counted the number of editorial and advertising pages in the April and May issues of MacUser and discovered that — gasp! — we have more advertising pages than editorial pages. "What about a 50-50 split?" he suggests. "I know you have to make your money as well, but couldn't you try to eliminate some of this advertising?" That's an interesting proposition, Michael. We could probably make do with fewer ads, but steel yourself for some sticker shock when our cover price goes to \$13.95.

Eve Homeyer, of Aspen, Colorado, asks, "Where is the program, extension, control panel, or who knows what that will make it possible to decipher, master, or lightheartedly accept your page-numbering system? I can cope with the overkill of high-gloss advertising pages that are hard to control, tear out, and/or destroy, but how come there are regular pages that never get a number? Do they count?"

We let our own Andy Ihnatko tackle this one: "It's for much the same reason that buildings don't have 13th floors. Folks in the computer industry, forced to put their blind faith in a higher,

unseen, and vengeful power every time they compile their code, are a superstitious lot, and so we skip certain unlucky page numbers. Unfortunately, they have a perception of unlucky numbers that tends toward the baroque: prime numbers, powers of 8, Fibonacci numbers, the number of escape pods on a Galaxy-class starship, episode numbers of 'The Simpsons'

that feature an 'Itchy and Scratchy' cartoon, the frequency of sonoluminescence in Dr Pepper, Z-Zhiroffsky sequences, and far too many others to list here." Got that?

We've also been criticized for being too political or not political enough. Case in point: "No matter how you feel about the difficult, complex issue of physician-assisted suicide, the gratuitous attack on Dr. Jack Kevorkian's character and motivation in the review of Lemmings

(June '93, page 79) ill becomes your generally excellent publication," writes John B. Andrews, of San Francisco. Guess we should have killed that review, huh, John?

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LETTERS

Performa Persistence

Russell Ito states that "Americans will indeed buy computers where they buy vacuum cleaners" and that your choice of software is dependent on "whether your Performa dealer also sells office furniture or washing machines" ("New on the Menu," June '93, page 33).

When will Ito and his ilk get over the fact that Apple has had to face reality and sell computers at large warehouse-type stores to compete with the incredibly low prices of 486 clones? (Answer: Very soon, I hope.) How long will Performa owners put up with Ito's and other writers' cheap shots? (Answer: Not very.) Am I ashamed that I got a great Performa 600 with a CD-ROM drive for a ton less money than if I had listened to the local computer-store salesman who told me I had to have a loaded Ilvx with FPU and memory cache for home use? Of course not.

Come on, Russell, grow up.
Richard Darling
Palm Desert, CA

Who-o-o Reads Us?

Your publication is an essential tool for us very few Mac users in Indonesia. Without it, we would wallow in ignorance. I have to hide and protect each new copy from my colleagues until I can finish it. This is particularly necessary because one of my close personal assistants is so enthused about your magazine that he tends literally to devour any old copy he can get his claws on. Thanks for keeping us isolated Mac users in touch with the industry.

Karen Mills
Jakarta
Indonesia

Scandalous!

On behalf of the scanner industry, and AVR in particular, I take issue with many of the statements made in "Getting the Picture: Color Flatbed Scanners" (May '93, page 106). Contrary to the statement made in your opening paragraph, most scanners are up to the task and have a proven track record of performance.

Software plays a vital role in a total scanning package. With the notable exception of Hewlett-Packard, most of

today's scanner manufacturers provide Adobe Photoshop (\$895 retail) with their scanners. If you add the price of Photoshop to the HP scanner, it costs in excess of \$2,000. Definitely not inexpensive, as you assert in your article.

As for hardware, the scanner engine is normally defined as the "brains" of the engine and is commonly considered to be the control board, the hardware, and the design of the optics that surround the CCD (charge-coupled device)—not the CCD itself, as listed in your features chart. Unlike the other manufacturers whose products you tested, AVR produces its own engine and is the only U.S. scanner manufacturer to do so.

Your scanning platform is the Mac Ilci, which does not take advantage of the SCSI-2 interface on our scanner. In this price range, the AVR scanner is one of the few that incorporate the SCSI-2 interface. I bet your readers would be more interested in seeing the results with the Quadra, which is optimized for image manipulation, multimedia, and desktop publishing.

Lumin Yen
Product Support Manager
AVR Technology
San Jose, CA



Bundling Photoshop with a product is not the same as providing good scanning software. Photoshop is a very cool program, but it doesn't drive scanners. It's excellent for fixing up the bad scans produced by many of the products we tested, though.

As for the engine, you're right — the CCD is definitely not the engine — and we acknowledge that the engine in the AVR scanner is an AVR engine. Regarding your comment about SCSI-2 support: If supporting SCSI-2 is important, why is it that the AVR scanners were so slow with regular SCSI? They should be able to go as fast as the host SCSI allows, but that was not the case. — MF

I was disturbed to read Bruce Fraser's article covering scanners, including the Hewlett-Packard ScanJet Ilc. Many of the author's complaints centered on Hewlett-Packard's lack of plug-in support for Adobe Photoshop and compatible programs such as Fractal Design's Painter. Second Glance has been shipping such a plug-in, ScanTasticps, for a

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Poor Claris. Once again, Canvas™ is running circles around MacDraw® Pro. In fact, they are still trying to catch up to Canvas 3 while we've added dozens of new features and enhancements to create Canvas 3.5. Like 3-D extrusions of text and graphics, enveloping of text and graphics, smart lines, fine kerning, fractals, automatic concentric circles and spirals, and a tool loader that allows you to add tools as you work. There's even a versatile pressure-sensitive freehand Bézier pen tool. And Canvas 3.5 has really outdone itself with new improvements including object blends, binding of text to shapes and curves, Bézier text conversions, and macro windows. Which is just the beginning, because Canvas also includes all the great features of 3.0 like custom parallel lines and curves, our unique SmartMouse™, and more. Comparing Canvas to the competition is like comparing a superbike to a tricycle. And only Canvas is self-upgrading, allowing you to add new tools, effects and file translators at will. Last but not least, while MacDraw Pro is idling somewhere back in the Dark Ages, Canvas features seamless file sharing with its recently released Windows version. Add it all up, and it's easy to see that it's time to shift gears to ultimate in value and performance, Canvas of your life. So go ahead and hop on.

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LETTERS

year. Our plug-in answers nearly all the requirements for the "ultimate plug-in" that Mr. Fraser outlines in a sidebar.

Lance Gilbert
President
Second Glance Software
Laguna Hills, CA

Because we feel that products should stand on their own feet, our policy has been to test products only in the form in which they're shipped by the manufacturer. With the advent of third-party scanning products such as Scan-Tastics, we're investigating a more comprehensive approach. Thank you for the nudge. — MF

Metaphor for Metamer

Every month I look forward to *MacUser's* innovative approach to product evaluation, and the May '93 issue was no exception. As a consultant and educator in the color arena, I couldn't wait to read Bruce Fraser's "Getting the Picture: Color Flatbed Scanners." The piece was good, except for one completely bogus evaluation. Color scanners do not have color gamuts! The word *gamut* has a specific definition: It is the range (volume) of color that can be produced by a device (a printer or monitor, for example) by mixing colorants, such as dyes or pigments. *Gamut* is handy for describing printer and monitor performance, and it's tempting to apply the word to devices such as scanners. But, because scanners are color-measuring devices, not color-rendering devices, using *gamut* to describe scanners' performance is incorrect. In color science, the term *metamerism* describes the mistakes scanners (as color-measuring devices) make.

Peter G. Engeldrum
President
Imcotek, Inc.
Winchester, MA

You're right, Peter, if you assume that scanners are color-measuring devices — a defensible position, with the caveat that some are much more accurate devices than others. We'll concede that gamut should be applied only to output devices, if you'll give us an alternative word. Metamerism describes the colorimetric mistakes an individual scanner makes, but it's meaningless as a way to compare two or more scanners. — MF

In Livid Color

I reluctantly have to agree with John C. Dvorak's observations on the state of the Macintosh interface ("Mac's Monochrome World," June '93, page 310). The differences between the Macintosh and Windows systems hit me straight between the eyes at a recent PageMaker 5.0 demo. There, on a huge 22-foot screen, were displayed the Windows and Mac versions of PageMaker 5.0. The

Windows version of the program looked way cool, but the Mac version looked way dull. Apple has allowed the Macintosh interface to stand still. Although it's true that you can find shareware items that give you 3-D buttons and check boxes, these often take up more RAM and cause more

trouble than if they were an integral part of the system software.

Jeff Gagné
Burr Ridge, IL

As usual, John Dvorak is completely off base. He criticizes the Mac interface for being too oriented toward black-and-white displays. I find the typical Mac screen to be simple, elegant, and refined. I don't feel I need color to make the most of my machine. When color is present, it is simply an enhancement. In contrast, the typical Windows screen looks like an explosion in a Walt Disney factory. You can't use Windows with a monochrome monitor (such as the large two-page monitors preferred by desktop publishers) because it is so dependent on color. Despite Microsoft's claim that Windows supports a wider range of hardware than the Mac, it forces people to choose a type of monitor that may not be appropriate for their work. Given the choice, I'll stick with the Mac.

Stephen Lardieri
Atlantic Highlands, NJ

Dvorak is right when he says that color is contributing to the migration from Mac to Windows, but consider: People came to the Mac because it was visionary, a new computer that did things in a new way. These people are just repeating history and going to where the new visions are. The Mac is standing still. People rag on Intel's 80x86 and BIOS for being

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ancient, but what about the Toolbox and the going-on-fifth-generation 68000 (which won't be faster than the Pentium). Apple has always been a step behind everyone else, as proved by the still-unseen Newton. I don't doubt that the folks at Apple can create products (the PowerBooks, for example) that can outperform any other product on the market when they put their minds to it, but can you blame people for wanting to go where the action is?

Jaison Lee
Independence, OH

As a seventh-grader, I know very well the feeling of trying to do a project the night before it's due when all the other students have been working on theirs for two weeks. Dvorak's column "Mac's Monochrome World" shows he's been there too. What the article is supposed to be about is mentioned a third of the way into the second column, and he gives only one reason to support his argument — "you can customize every line and

dot on a Windows machine" — and even that makes no sense. I can change the color of the pixels on my Mac also. With no supporting statements, his composition falls apart. I give it a D-. He needs a central theme — and a brain.

End of lecture.
Matthew Burns
Sherman Oaks, CA

Missing Utilities?

Greg Wasson has compiled "13 work-smart utilities you can't live without" (June '93, page 84). Surprisingly, two of the best utilities were left out and belong at the top of the list. First of all, it's vital to include an antivirus product such as the commercial SAM 3.5, from Symantec, or the legendary freeware program Disinfectant 3.2, created by John Norstad. Second, every computer user has lost or will lose data, and Symantec data-protection software, Norton Utilities 2.0, can retrieve trashed files, defragment, optimize, encrypt, and back up, plus perform other chores a Mac user should be doing

in any case. Without products such as these, a list may be all you have.

Doug W. Bourquin
Richmond, CA

My One and Sony

I came away from the article "Affordable Luxury: Two-Page Color Monitors" (May '93, page 128) with the million-dollar question still unanswered: Are the Sony, Radius, SuperMac, and RasterOps monitors all really the same? Superficially they look very much the same, and the Sony OEM model numbers also look the same. If value is added by the companies, I wish they would make it clear. It seems that purchasing a good large-screen monitor is still a crapshoot.

Mike Welch
via ZiffNet/Mac

The four monitors you mention do use the same Sony Trinitron tube, but as we've noted, the tube isn't everything: The real value added by each vendor is the product's software, tech support,

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Looks like another LaserJet breakthrough for Macintosh.



- It's the breakthrough you've been waiting for: the HP LaserJet 4ML. The most affordable LaserJet printer ever made for Macintosh.
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warranty, and price. We found Sony's tech support unsatisfactory. Our bottom-line picks — the RasterOps 20T/Multiscan, the SuperMac SuperMatch 20•T Multimode, the Radius Precision-Color Display/20, and the Nanao Flexscan F750i 21" — represent the best all-around value. — EMW

Book Clubs

The article on Mac books by Bob LeVitus ("The Essential Mac Library," June '93, page 177), failed to mention an important source for Mac books and information. The Mac Professional's Book Club (Newbridge Book Clubs, P.O. Box 507, Riverside, NJ 08370) mails a monthly brochure describing a good selection of current Mac books, which can be purchased at a discount by mail. This may be of particular interest to Mac users in rural areas where there are no bookstores or no Mac books in the stores that are there.

Pierette Appasamy
Pittsburgh, PA

Under Their Skin

Concerning recent complaints about Dvorak, I'd like to cast my vote in favor of the guy. I find John's comments to be some of the most refreshing in the magazine, and I'm glad that he is getting under the skin of some of the most zealous Mac fans. As much as I love the Mac, I begin to recoil whenever I'm around serious Mac-heads, and I react by expounding on the benefits of the PC.

The Macintosh is not beyond reproach, and it is by no means a perfect computing platform. It is still too expensive, too unstable, and too unsupported, but it is the best thing out there for what I do — graphic design and publishing. For that reason alone, I have one. Once I've determined that another platform is better and less expensive, bye-bye, Apple.

Randolph Garbin
Watertown, MA

Corrections

We incorrectly reported that the Sicos Colani Mouse, from Moustrak (Personal Macintosh, July '93, page 197), comes in right- and left-handed versions. The Mac model comes only in a right-handed version. The PC mouse has both right- and left-handed versions.

In the table accompanying "Heavy-weight Hard Drives" (July '93, page 106), the phone numbers listed for Insight were incorrect. The correct toll-free number for the company is 800-927-7848,

and the correct customer-service number is 602-902-1176.

The phone number shown for Logical Solutions (Quick Clicks, June '93, page 80) is the company's fax number. The correct telephone numbers are 800-645-2495 and 612-659-2495.

The book *Newton's Law*, by Andrew Gore and Mitch Ratcliffe (Power Tools, June 93, page 191), will be available this fall from Random House Electronic Publishing (800-733-3000 or 212-572-6045).



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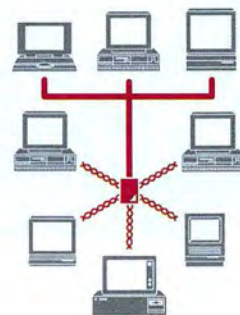
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CIRCLE 86 ON READER SERVICE CARD.

Getting Back on Track

What will Apple Computer be like, now that Michael Spindler is running the operation? In short: leaner, meaner, and more focused.

For those of you who wouldn't recognize Spindler if he were sitting next to you (hint: He's tall and dark and speaks with a German accent), I have a little insight into the man, having spent the last five years of my life at Apple, disseminating information on the strategic plans he and other executives have plotted for Apple.

A little background first: Unlike John Sculley or IBM's Louis Gerstner, who cut their teeth in consumer marketing, Spindler grew up in the computer industry. Having worked at Intel, Digital Equipment, Schlumberger, and Siemens before coming to Apple, Spindler was an integral part of the industry as it migrated from mainframes to minicomputers to microcomputers. He's so knowledgeable about the inner workings of computers that if you're in a room with him and there's a white board handy, watch out, because he's just as likely to launch into a lecture on the fundamental design aspects of a microprocessor as he is to discuss the protocols for connecting Macs into an IPX/SNX Novell network. One never emerges from a meeting with Spindler failing to see that he loves technology and understands its potential.

Playing Catch-up

But an appreciation of technology will not be enough to put Apple back on track. Although Apple is fundamentally in good shape (good technology, excellent brand recognition, money in the bank), it's in catch-up mode. The price/performance of too many Apple products is behind the curve again, due to the fierce competition in the PC industry: Windows continues to challenge Apple's superior user interface, workstation manufacturers such as Sun and Silicon Graphics are entering the fray with superpowerful PCs at affordable prices, and third-party developers are taking resources away from the Macintosh platform and moving them



**Apple's got a new boss —
here are the top ten
action items he should
focus on.**

toward Windows development, to name a few examples. Add to that declining profit margins, the pressures that come from being a public company, and a wobbly economy, and you come up with a challenging situation.

It will be interesting to see how Spindler meets these challenges. He's a tough taskmaster and more than capable of making the difficult decisions needed to make Apple competitive again. By the time this issue is in print, Spindler will have made his move to cut expenses substantially. Although these cuts will be tremendously painful for Apple, a leaner organization will enable Spindler to make more-aggressive pricing decisions to bring Apple products in line with their DOS counterparts. I would also guesstimate that Spindler will streamline the various product divisions to focus on the areas where Apple can win, namely the core Macintosh business — desktop and mobile computing. This all bodes well for Apple's legions

of fans, because Spindler will not forsake the installed base to pursue unknown markets.

It is a daunting task, and I'd like to offer a list of the top ten action items Spindler should focus on:

1. Clone the Macintosh. If you're ever going to make your market-share strategy happen, you have to let the Mac be cloned. We realize you've probably spent a year's worth of profits on having attorneys threaten anyone attempting to clone the Mac, but this sacred cow must be sacrificed. Give clone manufacturers the low-end, low-gross-margin products, and keep the high-gross-margin products for yourself.

2. Port the Mac OS to Intel machines. Apple's proprietary point of view has been your Achilles' heel for years. Actually, you probably should have done this five years ago. Yes, this has the potential to hurt hardware sales if you continue to price Apple products too high, but if you combine Apple's legendary industrial design with competitive pricing, you should be in good shape. Rumor has it you're already doing this. Hurry up!

3. Simplify the product line. Users don't know what to buy anymore, and they hesitate to make a decision for fear Apple will come out with a cheaper, faster, better product two months later. Consolidating the product line also helps you with another problem: reduced resources.

4. Don't make peripherals if you can't do them well. To put it kindly, this has not always been the case (the Express Modem comes to mind). Focus on what you do well (printers, monitors), and work with third parties to have them provide the rest of the peripherals for customers. This has two benefits: Third parties may funnel some of the Windows resources back to the Mac market, and you can find another item to cross off the budget. (Watch the movie *Dave* for a good example of putting your resources where they count.)

5. Don't cut support and service. We realize that you have to cut costs, but

we implore you not to cut support and service. You may have people who come fix your computer and figure out all the compatibility problems, but average customers get shunted around unmercifully as they try to make sense out of the

increasingly complex array of product choices and compatibility issues. Yes, the Mac is easier to set up and use, but it's not *that* easy.

6. Make the PowerPC upgrade as painless as possible. This is critical.

Because a substantial amount of your sales comes from Mac owners upgrading to a higher-performance CPU, you'd better make sure that their investment in software and peripherals is not left to collect dust when they're the first ones to fork over the cash for a new PowerPC Macintosh.

7. Price-protect. Yes, this has financial implications, but Apple upset many customers with the IIvx debacle. It's that kind of shortsighted action that pushes people toward DOS and Windows.

8. Build more PC connectivity into the Mac. Face it, it's a PC/Windows-dominated world. If you want to get market share, don't make users struggle to find a connectivity solution. Build it in to the box, and they will come.

9. Make your marketing messages clearer. The Hard Way/Easy Way campaign was a step in the right direction, but you need to go even further. For the uninitiated, it's about as clear as mud why they should buy a Mac over a PC with Windows. If they're making the decision based on price, Apple loses, unless you're planning to bring Mac prices into parity with clone boxes running DOS and Windows (hard to believe you'd go that far).

10. Don't forgo innovation. We know you know this, but people buy the Mac because it's a better "experience." Don't let them down by reducing your investment in user-interface development and other forms of research that will make the Mac truly better, not just good enough.

A Note to Readers

Don't be surprised if you don't see Apple in the news as much as you did when Sculley reigned. Spindler is not the master of publicity that Sculley is. That's not cause for worry, though, because it simply means that Spindler is focusing on getting Apple's house in order and putting Apple on the right track.

I imagine that you have even more ideas than I do on what Apple should focus on. Send your ideas to my attention at *MacUser*, and we'll make sure Apple gets the right message from Mac users. ✉

Maggie Canon, who spent five years managing publications for Apple Computer, is MacUser's new editor-in-chief. Previously she was editor-in-chief of InfoWorld, A+, and Macintosh Today.

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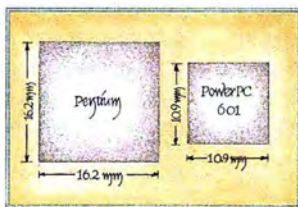
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Motorola's announced simulation performance of the 66MHz version of the MPC601. Thermal comparison is based upon preliminary Intel specification for the 66MHz Pentium, and the performance of samples of the 66MHz version of the MPC601.

CIRCLE 72 ON READER SERVICE CARD.

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The PowerBook from Hell



Bought a Mac lately? Better hope that Apple Computer doesn't do unto you as it did unto Merdinger.

Apple Computer is a huge, highly profitable Fortune 500 multinational corporation, but for many people, Apple is more than that. Apple is a wonderful group of people who aren't satisfied with The Way Things Are and strive to make things The Way They Ought to Be.

This is an image Apple has carefully cultivated and has steadily profited from. It is also, at least to an extent, true. It's therefore that much more disappointing when Apple behaves like . . . well, like a huge, highly profitable Fortune 500 multinational corporation. Witness the sad tale of Ilene Merdinger and her simple desire to own a PowerBook.

Ilene, ironically an advocate in a New York law office, is one of those kinds of people Apple's always photographing for its ads and annual reports. From the moment she saw a sledgehammer hit Big Brother during the 1984 Super Bowl, she longed for a Macintosh. She thought the Mac was an extraordinary product; furthermore, she believed she'd be supporting a company she could trust and respect.

In spring 1992, she started shopping for a Mac. On top of reading everything she could get her hands on and talking to dealers, she repeatedly called the Apple Customer Assistance Center. Unlike many dealers, these folks quickly, capably, and thoroughly answered her questions, she thought, helping her focus on the final object of her affections: a PowerBook 140.

Ilene was all set to buy, but she's no fool. She made one last phone call to the center to ask one last question: "This isn't exactly kidney surgery here. I can afford to wait a little longer. Are there any new models on the horizon — anything that maybe I'd want to hold off another three to six months for?"

At this point, if this were a teen slasher film, we'd all be shouting at the screen, "Don't go into the woodshed!" Yes, the Apple Customer Assistance Center assured her, there were no new PowerBooks planned for the immediate future. She asked this dang near every time she called and always received the same answer: nothing on the horizon for the next few months. So she bought her 140 from J&R in New York and called the center to allay her fears one last time before she broke the seals on the box.

Sure enough, things went south soon after J&R's authorized technicians installed a new PSI fax modem in the 140. After a few days

of fax nirvana, the modem started wonking up: It refused to receive incoming faxes and sent faxes only sporadically. Worse, Ilene's new 140 was soon cursed with seemingly random system freezes and bombs. J&R did its best, but after a month's worth of various attempts to fix the problem, including twice swapping the modem out with a brand-new one, the 140 was still plagued by sporadic crashing and freezing and was corrupting files left and right. In fact, every now and then, Ilene's PowerBook refused to boot at all. PSI gallantly offered to take a look at her PowerBook themselves. They sent it back to her with the diagnosis that it was hosed in a major way: There was a definite problem, but it wasn't their fax modem's fault. During those first couple of months of operation, Ilene's PowerBook was tested and repaired by authorized technicians on a nigh-weekly basis.

Meanwhile, not three weeks after she purchased her 140, Apple released the PowerBook 145 — a better machine at a lower price. This would be only the start of Ilene's bad experiences with Apple.

After upgrading her 140 from a 4/40 to an 8/120 configuration, she sent it to Apple for warranty service. There Apple replaced its logic board — and its casing, which had been opened up for service so many times that cracks had formed around its back screws. OK, there are few problems a motherboard replacement can't cure, right? Wrong. Not only was Ilene's PowerBook returned to her with its maladies intact but now her disk drive had also gone south. A week after receiving the computer, she shipped it right back to Apple. Now the company replaced its daughterboard, floppy drive, and display-cable shim — if you're keeping score, she now had more or less a brand-new 140 — and for good measure, they removed her third-party memory card, claiming that it was the source of her problems. As a peace offering, Apple sent the 140 back to her accompanied by a form letter of apology and a free battery.

A nice gesture, but it would have been nicer still to send the 140 back to Ilene cured of its infirmities. Oh, and that "defective" memory card? To this day, it's performing flawlessly in the PowerBook of a friend. All in all, the PowerBook has been sent to Apple for service five times, and although Ilene has never been rewarded with a working

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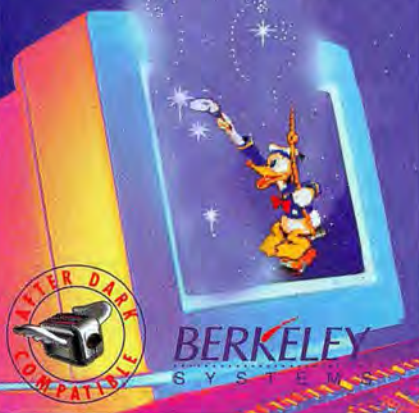
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CIRCLE 27 ON READER SERVICE CARD.

ANDY IHMATKO

PowerBook, she can give you a great deal on batteries: Apple has sent her four freebies. Once, they even lost her 140 completely; they had absolutely no idea where it was, and after more than a week, it reappeared on her doorstep with no evidence that the shipping carton had ever been opened.

But Ilene hung in there. She'd been talking to Randy Battat, Apple's vice president of portable computing, and he assigned someone to work on her case directly. Let's call him Chip. Ilene regards Chip as one of the good guys, because he almost always returned her calls and took real steps to put things right. At the end of this technical equivalent of Mr. Toad's Wild Ride, Chip decided to just scrap it all and replace Ilene's 140 with a brand-new PowerBook 145 or 170. Ilene asked him if she could have a 160 or a 180 instead and make up the price difference herself. After some negotiations, Chip agreed and told her he'd handle all the paperwork.

But fate intervened. Ilene had contacted Apple CEO John Sculley too, and his office had put *another* gumshoe into the mix. We'll call her Dale, but Ilene has another name for her: the Customer Service Person from Hell. After a tense series of conversations, Dale intervened and put the kibosh on the happy resolution of Ilene's ordeal. Ilene may have a new 140 or may have her 140 repaired. There were to be no other options.

The final chapter to Ilene Merdinger's sad tale has yet to be written. Now all of Ilene's phone calls are routed directly to Dale, and it's clear that she regards Ilene as little more than a crank; nothing more will be done. Apple, by avenue of ignorance, has taken a customer who would have been more than happy to remain a loyal customer for life and proved to her that her faith and trust were completely misapplied. The people in her office, who once looked at Ilene's PowerBook and wanted one of their own, are now likely to forever associate Apple with bad customer relations. Score one for Microsoft.

Ilene bought a lemon 140. Hey, it happens. But rather than seizing this as an opportunity to prove to Ilene and anyone she happened to talk to that when screw-ups of this magnitude occur, Apple makes equally magnanimous gestures to put things right, Apple shot itself in the foot.

Intervention on my part has yielded nothing more than corroboration from Apple of most of the key facts of this

story. In fact, several of my phone calls went completely unanswered. Therefore, as folks who have faith in the power of The Macintosh Community, we ought to take action. As I see it, there are three possible conclusions to reach after reading this story. Please look them over and take the prescribed action if you agree that it's appropriate:

Apple's right; Ilene's wrong. Go soak your head.

Apple is in such dire financial straits that they can't afford to send one crummy PowerBook 160 to a customer whom they've put through hell. Please gather canned goods, articles of used clothing in good condition, and deposit bottles and cans and send them to Randy Battat, Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014, attn: Free the Merdinger 140. Enclose a copy of this article and a suitable cover letter conveying reassuring words of hope to ease them through their troubled times.

Ilene's right; Apple's wrong. Compose a suitable letter of outrage, and mail it to Mr. Battat at the above address or fax it to him at 408-974-9441.

If you choose one of those last two, I'd be interested in hearing about any replies you happen to receive from the Mothership; send 'em on in to me c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Or e-mail 'em to me at 72511.204 (CompuServe), andyi (America Online), andy (AppleLink), or andyi@world.std.com (Internet).

Addendum: Just as this issue went to press, I had my semiweekly chat with Ilene, who brought news of a phone call she'd received a few hours earlier from Randy Battat. During the course of their conversation, Ilene idly mentioned to him that she'd been in a store playing with a PowerBook 165c a day earlier. Before she could complete her sentence, Randy said, "If you want one, it's yours."

Furthermore, he promised to personally handle any future problems that might crop up. So although Ilene doesn't actually have that 165c in her hands just yet, there *might* be cause to hold off on shipping that case of Spam and carton of old sweaters. I'll give you a full update in next month's column.

Oh, and by the way, Randy also assured Ilene that Apple's sudden renewed interest in her case after six months of inaction has nothing whatsoever to do with MacUser's involvement. Just to set the record straight . . .

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What Apple's Doing Right



Even Apple can't help but do some things right. Lately, it's getting to be a habit.

When the computer company that runs on whizzy demos stages a major event, no observer is supposed to walk away undazzled. Dazzled, then, by Apple's Worldwide Developers Conference, I can only say that Apple has got its act together and its show on the road.

The Drubbing of Mike Dell. Mike Dell is the king of mail-order PCs. But Dell Computer has just stumbled badly in an area in which it should have done well: portables. One reason for the stumble was the internal disorganization that follows rapid growth; but another, I believe, was underestimating Apple's PowerBook strategy.

Well, you can hardly blame Dell. Two years ago, the idea that Apple Computer could compete with low-margin king Dell would have been a joke. The two companies were not even in the same market. Now, as reported at the conference, the portable-computer market is dominated by Apple, and it's not clear that Dell should even be in it. This is extraordinary.

The Hats of David Nagel. Whatever the beltway bureaucrats think about necktie power symbolism (Is yellow or green in?), the ultimate power fashion statement is wearing two hats. The cat in the hats at Apple is David Nagel. His business card tells the story: Senior Vice-President and General Manager of the Macintosh Software Architecture Division and the Advanced Technology Group.

Wearing the boss bonnets of ATG and the Macintosh Software Architecture Division gives one freedoms that elude the singly chapeau'd. You get to brag, "We'll double the System 7 market in a year" and then later call for scrapping the current Mac interface in favor of something "as different from the GUI as the GUI is from character-based interfaces." Message? The Mac will continue to evolve rather than, say, die. Nice message.

The Crushing of Steve Jobs. Exhibiting the charm for which he is known throughout the industry, Apple cofounder Steve Jobs once told an ex-employee "we could crush you like a bug." On later being forced out of Apple, Jobs founded NeXT, a company that produced a superb object-oriented development environment called NeXTstep and a failed machine. After belatedly dropping the hardware and screwing up a deal with IBM (thereby pushing IBM into an alliance with Apple called Taligent), NeXT has finally delivered NeXTstep on a hardware platform

with a measurable market, Intel 486 machines. But in the meantime, NeXTstep beaters — including Apple's Amber, which will be in developers' hands later this year — have been crawling out of the woodwork.

And Apple is placing Amber in the public domain. That's great for developers, good for users, and humiliating for Jobs.

The Verdict on Gordon Eubanks. He may get thrown into jail if Borland International's lawsuit is decided against him, but Gordon Eubanks is Apple's darling.


Apple is scrapping its own development software, the unloved MPW, and anointing Eubanks' company, Symantec, as its development-tools source. New Symantec/Apple tools will include Bedrock, a high-level system that will make it easier to develop applications that can run on several platforms.

This is good news for developers, who have grouched about MPW forever and who generally give Symantec's tools the highest marks. And good news for Mac users, who may see applications come to market faster and the disturbing trend toward Windows-first development nipped in the bud.

The Vision of John Sculley. Some have complained that Apple is spreading itself too thin, moving too fast, taking on too much. And when they cite the IIvx fiasco as evidence that Apple is not paying enough attention to its existing customers, it's hard to argue.

But Apple's pace is not too fast, and its reach is not too broad. We are now witnessing the beginning of a reorganization of worldwide industries that will redefine telephony, computing, the entertainment industries, publishing, and distribution; create new mega-industries that don't exist today; and redefine work itself. In response, Apple is staking out turf in distribution, content, publishing, and consumer electronics — a shotgun blast that is dead on target.

The T of Morris Taradalsky. The last time I saw Enterprise Systems Division General Manager and ex-IBMer Morris Taradalsky address a crowd, he wore a suit and talked too slowly. Apple executives talking about Apple technology are supposed to sound as if they can barely contain their enthusiasm. The phrase *insanely great* is no longer de rigueur, but bubbling is.

And at the Developers Conference, Taradalsky, bless him, wore an Apple T-shirt and bubbled. Amid all the changes, it's nice to see traditions honored. 

**“I DON'T NEED (tick) YOUR
DATA (tick) PROTECTION SOFTWARE (tick).
I'VE HAD MY MAC (tick) FOR
YEARS AND (tick) IT
HASN'T CRASHED (tick) YET.”**

Not to alarm you or anything. But if a lot of wishful thinking is all that's standing between you and a Mac meltdown, you may want to check out a more proven method of protection.

We suggest the Norton Utilities for Macintosh v2.0. It both prevents data loss and gives you the most effective



Without us, one crash can ruin your whole day.

data recovery features available. In other words, it's like giving your computer its own personal bomb squad.

For starters, let's talk prevention. The Norton Disk Doctor hunts down potential problems and lets you squash them before they become actual nightmares. Plus, Speed Disk defragments files and boosts performance of your hard disk, making data loss less likely in the first place. So far, so good.

Now, the recovery part. Our FileSaver feature keeps a record of vital disk information, which helps



From Peter Norton, the leader in Macintosh utilities.

you rescue files if you happen to lose or delete them. On top of that, you get automatic backup. It's total security like this which has helped Norton Utilities become the best-selling data protection and recovery software in the world.

To learn more, dial FAST FAX 1-800-554-4403 and select option 1, document 411. (For information on easy network installation, choose option 1, document 481.) Better yet, pick up Norton Utilities at your local dealer for about \$149.*

You should probably do it today, though. Before your luck runs out.

**THE NORTON
UTILITIES**
FOR MACINTOSH
SYMANTEC.

*Suggested retail price. Actual price may vary. All names are trademarks of their respective companies. For more information in Europe, call 31-71-353111. In Australia, call 612-879-6577. In Canada, call 1-800-465-2266. Everywhere else outside U.S., call 408-252-3570. ©1993 Symantec Corporation.

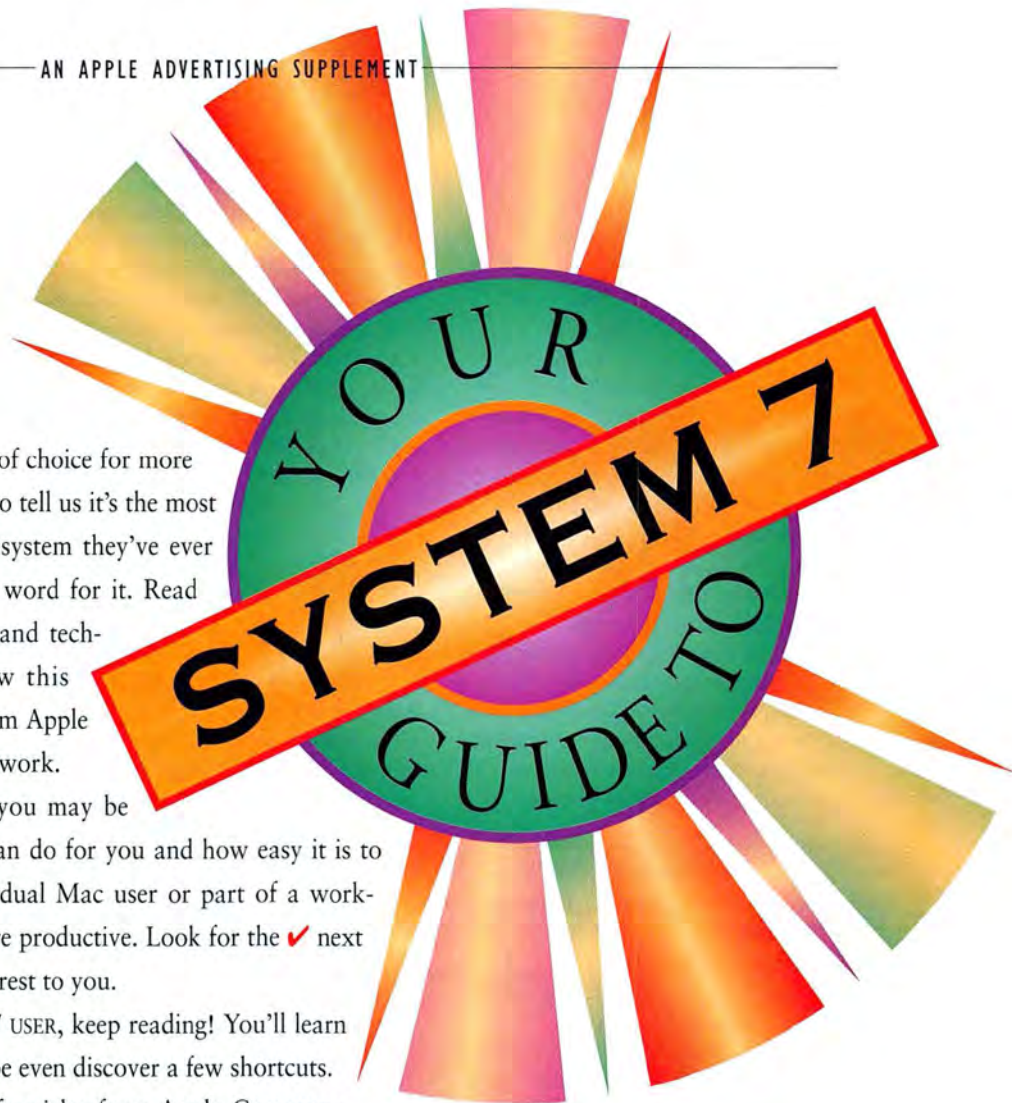
SYSTEM 7 IS THE OPERATING SYSTEM of choice for more than 6 million Macintosh users, who tell us it's the most powerful, easiest-to-use operating system they've ever worked with. But don't take their word for it. Read through our collection of 25 tips and techniques and see for yourself how this award-winning system software from Apple Computer can simplify your mousework.

IF YOU'RE A SYSTEM 6 USER, you may be surprised at how much System 7 can do for you and how easy it is to upgrade. Whether you're an individual Mac user or part of a workgroup, System 7 will make you more productive. Look for the ✓ next to tips that will be of particular interest to you.

IF YOU'RE ALREADY A SYSTEM 7 USER, keep reading! You'll learn what's new in version 7.1 and maybe even discover a few shortcuts.

This is the third in a series of articles from Apple Computer designed to help you get the most out of System 7. In the May issue of *MacUser*, we focused on personal productivity. In the July issue, we showed you ways to work more easily in groups and to manage a network. In this installment, you'll see how System 7 enables you to work more productively with your favorite applications. More than 6,000 applications are fully compatible with System 7, and hundreds of programs offer time-saving features that are only available under System 7.

**25 Ways
to Work
Faster and
Smarter
with Your
Macintosh**



Application power • Faster file access • Multitasking • Up-to-date data • Memory expansion • File sharing

1 Monitoring Your Mac

When you pull down the Apple menu in System 7, you'll see a new command, called About This Macintosh, which replaces the About the Finder command of System 6. Selecting About This Macintosh brings up a window that shows at-a-glance information about your system configuration, open applications, and memory usage.

The top part of the About This Macintosh window lists the Mac model, system software version, amount of installed memory (RAM), total memory (including any virtual memory), and the largest block of

The bottom part of the window is a bar chart that shows how your memory is being used by the system software and each open application. The amount of memory shown for the system software includes extensions, fonts, and control panels. The memory allocation for an application reflects the value specified in its Get Info window (see Tip 12).

2 Simplifying Network Backups

Retrospect Remote 2.0, the network backup software from Dantz Development, lets you automate the process of backing up and archiving files for an entire network. Under System 7, you can make the process even simpler by using labels. Here's how to do it:

Instruct everyone on the network to use the Labels control panel to name their first two labels Backup and Archive. From this point on, they should assign the Backup label to all of

their essential files (select the files and choose the Backup label from the Label menu) and the Archive label to those they rarely use but don't want to throw away.

Each night, Retrospect Remote will automatically scan every disk on the network and copy all files labeled Backup to the designated storage device. Files marked with the Archive label will be copied to a storage tape, verified, and then deleted from the users' hard disks.

This approach offers several benefits. Important files are backed up frequently, safeguarding data and freeing up valuable disk space. And

by using System 7 labels, users don't have to shuffle files between folders to take advantage of Retrospect's automatic file backups.

Fast Fact: The single-user version of Retrospect also can use labels to automate backups.

3 Easier Mail Merges

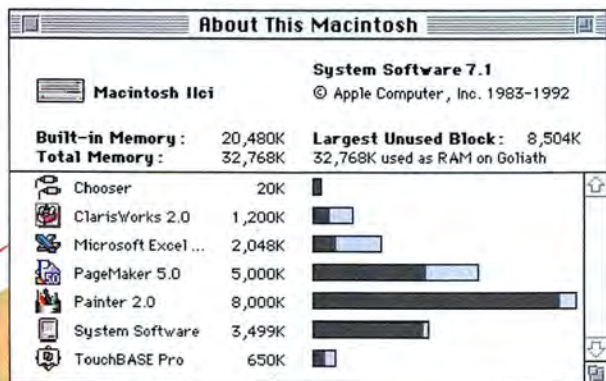
Do you have a form letter or invoice that you regularly send to several people at a time? Then you'll appreciate this tip for simplifying mail merges between two popular Claris products, FileMaker Pro and MacWrite Pro.

Let's say you want to insert customer names and addresses from your FileMaker Pro database into a form letter. First, create the letter in MacWrite Pro, set up the merge fields, and save the document as a stationery file.

Next, use the ScriptMaker feature in FileMaker Pro to quickly create a script that exports the name and address fields of the currently found records to a file, then launches MacWrite Pro and opens the form letter. Make a button for the script in your FileMaker Pro layout so you can invoke it with a mouse click.

From now on, whenever you click the button, FileMaker Pro will automatically export the names and addresses and then place you in the MacWrite Pro document. All you have to do is use the Mail Merge command to select the export file. MacWrite Pro will merge the names and addresses with the form letter and print the letters for you.

This time-saving technique is one benefit of Apple Events, a powerful feature of System 7 that enables programs to work cooperatively, exchanging information and even controlling one another.



Choose About This Macintosh from the Apple menu and you'll see at-a-glance information about your system configuration and memory usage.

number doesn't always equal the total amount of free memory, however, because memory can become fragmented as you repeatedly open and close applications. To defragment the memory and create a larger unused block—perhaps enough to launch another program—quit all of your applications and then reopen them in sequence.

unused memory.

This last figure, Largest Unused Block, tells you how much memory is available to launch additional programs. The



4 Avoiding Extension Conflicts

System 7 handles extensions (INITs) differently than System 6, a bit of trivia that can prove valuable if you need to reorder them to eliminate a conflict that's hanging up your Mac.



System 7 loads extensions alphabetically, just like System 6, but it runs through the ABCs three times. First it loads the items in the Extensions folder, then those in the Control Panels folder, and finally any extensions at the top level of the System Folder. As a result, a control panel, such as After Dark, now loads after QuickTime, an extension.

To make System 7 load a control panel first, begin its name with a blank space and put it in the Extensions folder. Likewise, if you have an extension that must load last (after the control panels), begin its name with a tilde or diamond and leave it loose in the System Folder. (To easily access control panels that have been moved out of their home folder, place aliases of them in the Control Panels folder.)

If you'd prefer not to sweat the details, use Startup Manager (part of Now Utilities 4.0 from Now Software). This handy control panel displays a scrolling list of extensions,



Managing your extensions is a breeze with Startup Manager, part of Now Utilities. You can change the loading sequence simply by dragging items to new positions and turn an extension off (or on) by clicking on its name.



5 Multilingual Computing

Do you need to correspond with colleagues in Tokyo—in Japanese? Want to produce an English/Polish/Russian version of your product literature?

No problem. System 7.1 turns your desktop computer into a true Mac of the world through language kits, extensions that let you work in other languages without changing your system software. The kits are based on WorldScript, a technology built in to System 7.1 that supports most written languages.

To make your Mac multilingual, you simply install an Apple language kit. Now you can run localized versions of applications or use a WorldScript-savvy program, such as Nisus 3.4 or WordPerfect 2.1, to create documents that mix two or more languages.

Apple is already shipping the Japanese Language Kit and will soon have kits available for Chinese, Korean, and Arabic. The Japanese Language Kit lets you input, edit,

display, and print Japanese characters in everything from letters and spreadsheets to presentations and promotional materials. You can even run interactive language-learning programs. (You still have to learn the language; the software just makes it easier!)

Nisus Software, the developer of Nisus 3.4, is a market leader in multilingual computing. Nisus 3.4 lets you enter text in several languages within a single document (see figure)—even right-to-left languages such as Arabic and Hebrew. Nisus fully supports Apple language kits and also offers Apple-licensed extensions for Czech, Farsi, Hebrew, Hungarian, Polish, and Russian.

allowing you to reorder items by dragging them to new positions and to turn extensions on or off by clicking on their names. Startup Manager uses underlying System 7 features to shuffle the extensions without changing their names.

Fast Fact: You can disable all of your extensions by holding down the Shift key when you turn on or restart the Mac. To turn the extensions back on, restart the Mac.

6 Fast Timbuktu Connections

Version 5.0 of Timbuktu for Macintosh, the cross-platform networking software from Farallon Computing, has many time-saving features that are available only to System 7 users.

For example, you can save any Timbuktu connection as a Connection Document, an icon you can place anywhere on the desktop. When you double-click the Connection Document, it automatically launches Timbuktu and reestablishes the link. You could maintain a folder of Timbuktu Connection Documents (much like the speed-dialing buttons on your telephone) that let you quickly connect to other Mac or Windows users to exchange files or share screens.



If you use Timbuktu with AppleTalk Remote Access (ARA), double-clicking a Connection Document will automatically redial the ARA link. ARA, a System 7 application from Apple, lets you dial in to a remote Mac and its network—say, from a PowerBook—and access files, E-mail, servers, and printers. Once connected, you can use Timbuktu to view the remote Mac desktop and work with files and applications as if you were actually there.

✓ = System 6 users, take note

7 Wireless Messaging

Your Mac can reach right into your pocket to deliver important messages—anytime, anywhere—thanks to Ex Machina's Notify. This system extension uses Apple Events to give your applications the ability to send wireless full-text messages to standard alphanumeric pagers.

The process is simple: You (or your application) select the data to be sent and the person you wish to receive it. The program passes the message to Notify with an Apple Event, and Notify dials into the messaging service's computer and relays the selected data.



With Notify, electronic mail from Microsoft Mail or QuickMail can follow you automatically

System 7 vs. Windows: You Decide



In March 1993, the Roper Organization surveyed both Macintosh and Windows 3.1 users and found that Mac users are more satisfied with their computers and with the amount of work they can accomplish with their systems.

Why are Mac users happier and more productive than Windows users? We think it's because the Mac has an integrated, intuitive operating system—System 7—that lets you focus on your work instead of your computer. But don't take our word for it; see for yourself.

A Single System

Because Windows runs on top of MS-DOS, you must learn the commands and idiosyncrasies of both operating systems. This is crucial

because you have to return to the MS-DOS environment to perform basic chores such as installing applications, setting up peripherals, and checking the system configuration. To check the memory allocation, for example, you must quit Windows and type *MEM* at the MS-DOS prompt; this brings up a text-based display. Even then, you need to understand terms such as conventional memory, expanded (EMS) memory, and extended (XMS) memory.

The Macintosh has just one operating system, System 7, and you never leave its familiar graphical environment. You can perform most tasks simply by pointing and clicking, without having to learn esoteric commands or terminology. To find out how much memory is available, you select About This Macintosh from the Apple menu. The resulting window also provides a visual display of how the computer's memory is being used by the System and all open applications.

A Consistent Interface

Learning two operating systems isn't the only challenge facing Windows users. Windows itself has a split

personality: Program Manager and File Manager. When you start Windows, Program Manager is running and you use it to open applications. If you want to copy, rename, or delete a file, however, you must switch to the File Manager program.

throughout the day. Your Mac-based Easy Alarms calendar can alert you to scheduled appointments when you're out of the office. If you're a network administrator, network-monitoring programs such as Dayna's Network Vital Signs and Neon's RouterCheck can page you with complete details as soon as they spot a problem.

Fast Fact: If your office is on a network, everyone can use a single Notify messaging server.

8 No-Hands Page Design

QuarkXPress 3.2, the professional publishing program from Quark, supports Apple Events scripting, allowing you to write scripts to automate many repetitive and time-consuming tasks.

For example, you could write a script (a series of commands) that

would automatically format the first line of every story in a document with a drop cap and small capitals. For periodic publications, you could use a script to open a QuarkXPress template, import the latest versions of text and pictures, insert the issue date, and save the template as a document.

You also can create scripts that launch other applications from within QuarkXPress and have them perform specific tasks, even if they are on another computer over a network. Catalog publishers, for example, could write a script that would retrieve parts information from a database (such as FileMaker Pro), format the data, and place it in a page layout.

To run a script from within QuarkXPress, you select it from the Script menu. You can write scripts with either UserLand Frontier or AppleScript, the powerful yet easy-to-use scripting language from Apple. QuarkXPress 3.2 comes with a run-time version of Frontier and several scripts for performing chores such as mail merge.

In contrast, System 7 is a fully integrated operating system that has a single, consistent interface for opening, copying, renaming, moving, and deleting applications and documents.

Automatic File Handling

Not only does Windows require that you learn two programs, but you also must keep them synchronized. If you make a change in one program, the other may not notice. Say, for example, you move Lotus 1-2-3 to a different directory (folder) in File Manager. Program Manager doesn't keep track of such changes, so it won't be able to find the application the next time you want to open it. To fix the problem, you must determine the new pathname for Lotus 1-2-3 and manually enter it in Program Manager.

This scenario doesn't exist on the Mac. System 7 automatically tracks the location of every application and document, even if you rename or move them. You never have to spend time showing the operating system how to do its job.

Another prime example: deleting an application. On the Mac you simply drag the file and its supporting documents into the Trash. Under Windows, this is a multistep process that usually requires three programs. Using File Manager, you delete the application's files and subdirectories; using Program Manager, you delete the application icon (or go through additional steps to delete a group icon). Finally, you open Notepad and delete all references to the application from the WIN.INI configuration file.

Descriptive Filenames

System 7 lets you name a file or folder almost anything you want. Using up to 31 characters, you can create a descriptive name that will help you identify the file's contents months later. Windows, however, is subject to the constraints of MS-DOS, so filenames are limited to 8 characters plus a 3-character extension. Furthermore, you can't use spaces or mix upper- and lowercase characters.

Compare the difference: System 7 lets you name a file Thank You Letter to Katherine. Windows makes you truncate the filename to something cryptic like TYLETKAT.TXT.

MYTH
My applications
won't work with
System 7.

FACT
More than 6,000
applications are fully
compatible with System 7,
including some previous
versions of many
popular programs.

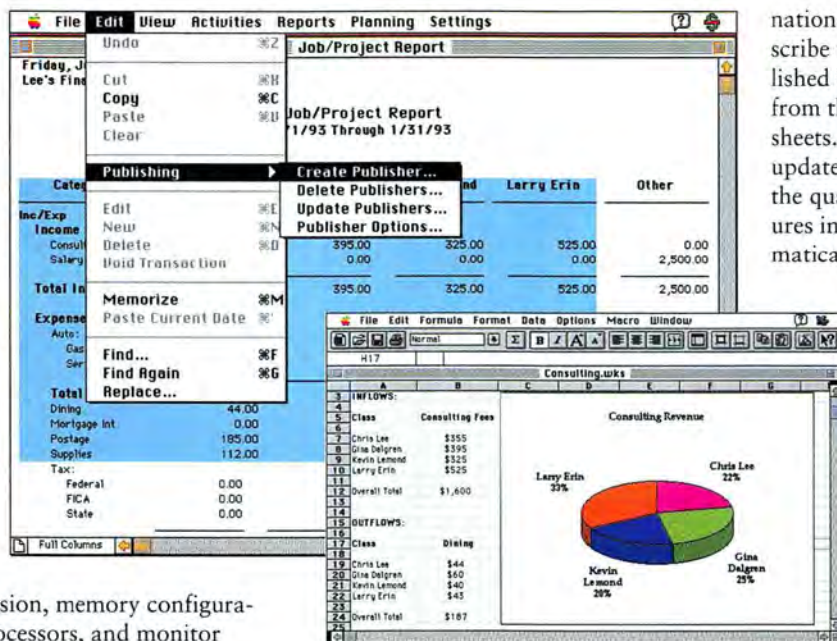


9 Preventing Upgrade Problems

Have you been postponing the upgrade to System 7 because you're worried about potential software conflicts or incompatibilities? Fret no more. You can uncover any pitfalls before you upgrade by using the Simulation feature of Help, the problem-solving utility from Teknosys.

To perform a "what if" analysis, tell Help which Mac model,

Publish and subscribe lets you create "live" links between documents from different applications. Change the data in this Quicken project report, for example, and the linked Excel chart will be updated automatically.



national sales, you could subscribe to regional totals published by your sales managers from their ClarisWorks spreadsheets. As the sales managers update their totals throughout the quarter, the charts and figures in your report will automatically display the latest sales results.

Finally, suppose you track your business finances in Quicken 4. You could publish a monthly project report and subscribe to it in Microsoft Excel, where you might fine tune the formatting or turn the figures into a chart. You could

even use the subscribed data to prepare a forecast for future months.

system version, memory configuration, coprocessors, and monitor characteristics you want to simulate. Help then examines every file on your Mac as if the simulated configuration actually existed. Its detailed report will identify problematic files, tell you the nature of the problem (an extension conflict, for example, or an application that isn't 32-bit clean), and even suggest possible solutions.



Fast Fact: If you're already a System 7 user but have hesitated to take advantage of features such as 32-bit addressing, virtual memory, or file sharing, you can use Help's Simulation feature to troubleshoot them as well.

10 Up-to-Date Data

The publish and subscribe capabilities of System 7 make it easy for you to gather information and keep it up to date. By publishing text or graphics from one document and then subscribing to it in another (or several others), you create a "live" link

between the files. Whenever the original data changes, every linked document is updated automatically, even over a network.

For example, you could create your company logo in Adobe Illustrator and make it available to other documents by publishing it. If you revise the original artwork, all files that subscribe to it—letterhead stationery, reports, presentations, newsletters—will immediately reflect the new look. This is a great way to ensure a consistent corporate identity.

If you use ClarisWorks 2.0 to compile a quarterly report showing

11 Organizing Your Time and Contacts

Personal-information managers are a boon to the busy, and After Hours Software (now a part of Aldus) has made the latest versions of TouchBase Pro and DateBook Pro even more efficient by integrating them via Apple Events.

You could, for example, make

Apple Events efficiency: Enter a To Do item in a DateBook Pro calendar and you can instantly retrieve the contact data from TouchBase Pro. Click the telephone number and the calendar will tell TouchBase Pro to dial it for you.

"Call Richard" a To Do item in your DateBook Pro calendar, then quickly retrieve his address and telephone number from your contact manager. No more tedious rekeying of data that you already have on file! Later, when you're ready to ring Richard up, click the phone number in your calendar and TouchBase Pro will dial his phone number.

Similarly, when you view Richard's record in TouchBase Pro, you can retrieve all To Do and Event items associated with him in your DateBook Pro calendar. You can even add new calendar items or edit existing ones—from within the contact manager—all courtesy of System 7 Apple Events.



13 Getting More Info

The Get Info window for a file, folder, or disk icon displays a variety of useful information, including the size, location, and creation date of the selected item. System 7 adds several new options, depending on the type of file you select.

The Locked checkbox, familiar to System 6 users, prevents an application or data file from being changed or deleted. Data files also have a Stationery Pad checkbox; clicking it turns the file into a read-only template. Now whenever you open the document, System 7 will create and open an untitled copy of the original file.

The Get Info window is also where you go to adjust an application's memory requirements (see Tip 12) and to customize file icons (see Tip 19). Need to find the original file for an alias? The alias's Get Info window shows the path to its parent; click the Find Original button and System 7 will open the appropriate folder and highlight the file.

14 Postscript Printing on a Budget

Did you know? You can combine System 7 file sharing with ColorAge's Freedom of Press Classic to provide a clever solution for network PostScript printing to a

12 Managing Your Memory

System 7.1 gives you more control over how much of the computer's memory is used by your applications. You can now set minimum and maximum memory allotments for each program—a useful strategy, because the multitasking capabilities of System 7 allow you to run several applications simultaneously, each claiming a slice of the memory pie.

When you open the Get Info window for an application, you see three RAM-related figures. Suggested Size shows the amount of memory the developer recommends for the application to run properly. You can't change this figure, but it's a useful benchmark for adjusting the values in the Minimum Size and Preferred Size boxes.

Minimum Size is the smallest amount of RAM in which the program will run. This alternate memory allocation enables you to launch the application in low-memory situations and to run more programs simultaneously. Don't set Minimum Size to less than 75 percent of Suggested Size, however, or the program may not run at all or may unexpectedly quit while you're using it.

The default value for Preferred Size is identical to that for Suggested Size. If you have enough RAM installed, however, you may want to increase the Preferred Size by 20 percent or more. This often helps the program run faster and open more (and larger) documents. Typing a larger value in the Preferred Size box can also eliminate "out of memory" messages and unexpected quits. In fact, memory-hungry applications such as Adobe Photoshop will use as much RAM as you can spare.



The Get Info window for an application lets you set minimum and maximum memory allotments. Adjusting the numbers lets you run programs in low-memory situations and avoid "out of memory" messages.

MYTH
System 7 is hard
to install.

FACT
You can install it
with one click of the
mouse. In a matter of
minutes, the Installer will
automatically upgrade
your Mac to System 7.

non-PostScript
printer—including
those that normally
can't be used over
a network.

Freedom of
Press Classic is a
software Post-
Script inter-
preter that
lets you
print Post-

Script files on inexpen-
sive non-PostScript color and
black-and-white printers, including
those from Apple, Canon, GCC, and
Hewlett-Packard.

To use Freedom of Press
Classic as a network solution for
PostScript printing, install it on the
Mac you want to use as the printer
server. Open the program, select the
printer, and choose Auto Print. Be
sure file sharing is turned on, then
share the folder named PS Output

(located in the Freedom of Press
Folder inside the System Folder). To
make the folder available to every-
one, open the Users & Groups con-
trol panel, select the Guest icon, and
click the checkbox labeled "Allow
guests to connect."

Now everyone on the net-
work—even System 6 users—
can access the PS Output folder by
selecting it in the
Chooser. Whenever
they drag or save a
PostScript file into
the folder, Freedom of Press will
automatically print it on the selected
printer. This allows network users to
print any PostScript file, including
those from other platforms, without
opening the original application.

Fast Fact: To create a PostScript
file, select the Print command and
click the radio button beside "Post-
Script file" in the Print dialog box.
The document will be saved to disk.



16 Managing Your Media

Drag-and-drop file launching is a
great way to open files in the Finder.
Just drag a document on top of an
application's icon, release the mouse
button, and the program will open
and display the file.

But drag-and-drop really shines
when you use it to catalog image
files in a mixed-media database pro-
gram, such as Kudo Image Browser
from Impace Systems. You can
instantly catalog all of the image
files in a folder, hard disk, or server
simply by dragging its icon over the
Kudo icon.

Two other time-saving features
in Kudo—Drag and Place, and
Reveal Original—rely on Apple
Events. Once you've
browsed the data-
base and located an
image you want to
use, you can place it directly into a
page layout by dragging its thumb-
nail from the Kudo catalog into an
open QuarkXPress or PageMaker
document. Too cool.

Kudo's Reveal Original com-
mand lets you quickly locate the
original image file for a catalog item.
When you select the command,
Kudo sends an Apple Event to the
System 7 Finder, which opens the
file's folder and highlights the
desired file.



15 Designer Fonts

If you need a bold new look for a product brochure
or want to evoke the rustic look of days gone by in a restaurant menu,
give your creativity an attitude adjustment with Fontek DesignFonts, a
series of spot illustrations available in both TrueType and
PostScript formats from Letraset. The six fonts range from
the bold geometric cats and masks of Attitudes, to the cut-
paper animals and leaves of Incidentals, to the wood-cut
food images of Organics.

The custom illustrations in these fonts provide a level of detail
typically found only in clip art. Yet because they are fonts, you have
hundreds of graphics at your fingertips—in the Font
menu—which require a fraction of the disk space of equiva-
lent EPS images. Because they are fonts, you can mingle the
images with text in the same paragraph and apply text styles
and special effects (such as boldface or color).

Because they are fonts, you can resize the images—from tiny to
huge—simply by changing the point size. And no matter what their
size, these graphics-cum-fonts will look smooth and crisp, both on-
screen and on paper.



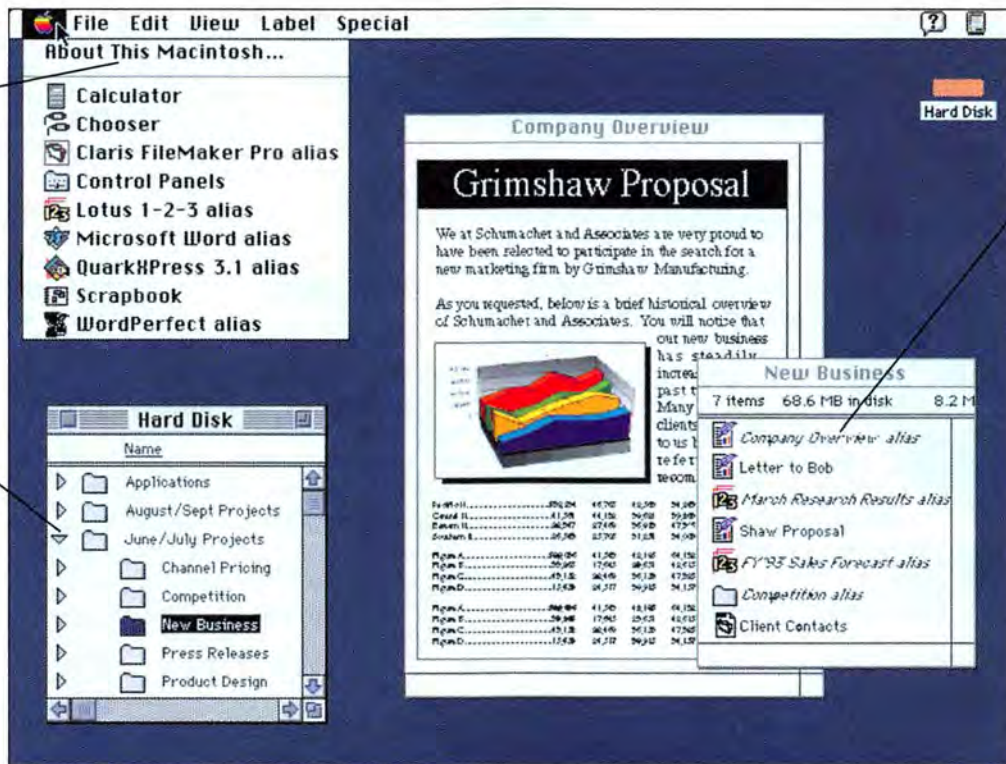
17 Staying in Control

If you're a list maker, you probably
love Attain's In Control 2.0, which
lets you organize all of your activi-
ties in a prioritized to-do list and cal-
endar. Under System 7, In Control
helps fight procrastination by letting
you open any document or applica-
tion directly from your to-do list.

How to do an honest day's work by using an alias.

The new Apple menu allows you to easily access anything on your Macintosh—files, applications, desk accessories, control panels, whatever—by simply placing it in your Apple Menu Items folder.

The Outline View feature lets you examine files inside a folder without having to open up a new window. Clicking on this triangle creates a drop-down list of that folder's contents.



Creating an alias is a great way to organize your projects so that files and applications can be in several places at once. Click on the "Company Overview" alias here, for example, and you actually open the original file containing your proposal to Grimshaw.

Finding information fast with System 7.

System 7™ software comes with an array of new tools that makes accessing information on your Macintosh® easier and quicker than ever.

To begin with, you can create an "alias." Designed to help you better organize your hard disk, aliases are not full-fledged copies of files but, rather, small 2K "pointers" to files, folders and applications, which you can put in as many places on your Mac® as needed. When you click on an alias, you actually open the original—no

matter where it's located.

The new Find feature lets you search for files, folders and applications, and then actually brings them right to the front of your desktop for you.

And with Outline View, simply clicking on the triangle to the left of the folder icon creates a menu list of its contents. So you never fill up your computer screen with multiple windows trying to find that buried file.

Of course, these are just a few of the ways



System 7 can help make you more productive.

They're also just a few of the many reasons why 5 million Macintosh users are now working with System 7, as well as with the more than 6,000 applications available that run on it.

For the name of the Apple® software reseller nearest you, call 1-800-732-3131, ext. 500. Or, if you're a current System 7 user, get the System 7.1 Update Kit by calling 1-800-769-APPLE, ext. 250.

And let System 7 give you the power to find what you have always been looking for. The power to be your best.*



You could, for example, link a to-do item called "Work on budget" to the corresponding spreadsheet simply by selecting the topic and using the Link To command to choose a file to associate with it. In Control then creates and stores an alias for the linked file.

From now on, you can access the spreadsheet directly from In Control with a single command. In Control will use the stored alias to locate and launch the appropriate application and open the linked document. Neat, huh?

You can't avoid commitments by leaving the office, either, because

In Control can use AppleTalk Remote Access to retrieve documents from a remote network. The diligent list manager will automatically dial the phone, connect to the network, and open the linked document on the remote Mac.

18 Powerful 3-D Modeling

StrataVision 3d, from Strata, is a modeling and rendering application that creates photorealistic 3-D

graphics. Mathematica, from Wolfram Research, can turn equations into sophisticated geometric graphs, contours, and shapes.

Thanks to the Interapplication Communication (IAC) capabilities of System 7, you can now combine the



power of these two applications to produce complex, fully rendered geometric designs, such as wave patterns, that would be difficult or impossible for either program to create on its own. If you're on a network, the programs don't even have to be on the same machine.

The Future of Publishing



In 1985, the desktop publishing revolution was launched with the Macintosh, the LaserWriter, and Aldus PageMaker. Later this year, Apple will take computer-based publishing to the next level with the release of QuickDraw GX, a system extension that adds robust features in the areas of graphics, fonts, color matching, and printing. QuickDraw GX will make it easy for every Mac user to produce professional-quality work from within any application.

Painless Printing

Once you install QuickDraw GX, you'll immediately notice that printing is easier and more intuitive. QuickDraw GX uses *desktop printers*—icons on the Finder desktop that represent the printers you commonly use. To print a document, you simply drag-and-drop it onto a desktop printer. What if you change your mind and want to delete the print job or send it to a different printer? Just double-click the desktop printer to open its window, then drag the job out of the print queue and drop it into the Trash or onto another desktop printer.

If you choose the Print command from within an application, QuickDraw GX will let you select a printer on the fly from a pop-up list, without opening the Chooser. You also can save documents to disk as *portable digital documents* (PDDs). A PDD file can be viewed and printed—with no changes in its appearance—on any QuickDraw GX-equipped Macintosh, even one that lacks the original fonts or the application that created the document.

Graphics, Fonts, Color

But printing is only part of the QuickDraw GX story. It also greatly expands the "under the hood" support for graphics, fonts, and color. With QuickDraw GX, the Macintosh operating system can rotate, scale, and skew both graphics and text. Graphics can have different resolutions and varying levels of transparency. Software developers can use this built-in functionality to quickly and easily add new graphics features to future versions of their applications instead of programming the features from scratch. This richer graphics foundation also lets you cut and paste images between applications without losing data.

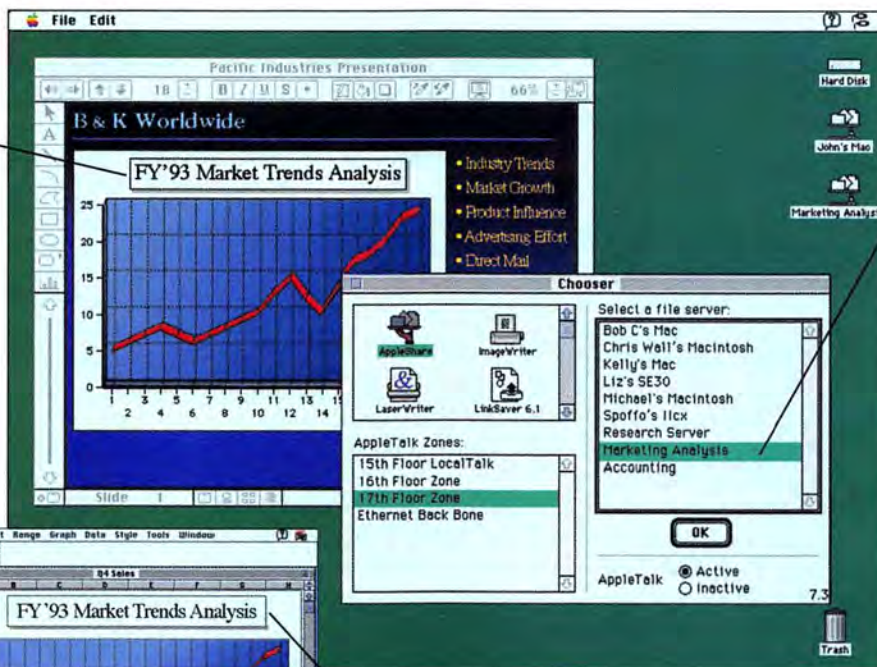
The new font architecture in QuickDraw GX supports an unlimited number of style variations, as well as kerning tables and composite characters for both TrueType and PostScript fonts. This means *all* applications will be able to offer excellent typographic capabilities such as kerning, tracking, automatic fractions, and automatic ligatures.

Finally, QuickDraw GX includes ColorSync, a color-matching system that provides consistent, predictable color regardless of the peripheral (scanner, monitor, printer) or software you use. This ensures that the colors you see on-screen match those that appear on paper.

Thanks to QuickDraw GX, advanced graphics, type, and color capabilities will soon be standard in all Mac software, from entry-level programs to professional publishing applications. Furthermore, the QuickDraw GX extension to System 7—in tandem with inexpensive color peripherals such as the Apple Color Printer and Color OneScanner—will help make color publishing as pervasive as black-and-white desktop publishing is today.

How to pull together 3 months of research in under a minute.

File sharing makes it easy for Macintosh users to exchange information and work together over a network. So, for example, you could pull this "FY '93 Market Trends Analysis" chart from your colleague's computer and incorporate it into your "B & K Worldwide Sales Report" in a matter of seconds.



Each Macintosh user determines which files are shared with which people. To access the chart on your colleague's Mac, you simply open the Chooser and select your colleague's file server or desktop computer name. Which, in this case, happens to be "Marketing Analysis."



You can give people access to your Macintosh and allow them either to change files or only look at them. In this example, your colleague has given you access to this "Market Trends Analysis" chart through a folder you both share on his Mac. You simply copy the chart into your presentation slide.

File sharing with System 7.

With System 7™ software and its built-in file sharing, putting together a presentation on your Macintosh® has never been easier or quicker. Even when the research you need for it is in someone else's computer.

Now, despite the fact that you and your colleagues may have different schedules, you can still collaborate on a project over your network. Because file sharing enables you to work with files on each other's computers.

You simply give your associates access to any

designated file or folder on your Macintosh, and they can work with your data from their computers.

So let's say, for instance, that your boss walks into your office and asks to see where you're at with your quarterly research summary. But the June findings happen to be on your partner's Mac, and she's out to lunch.

No problem. With file sharing, you can access your partner's data in moments.

Of course, this is just one of the many ways



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And see how easily System 7 can give you the power to pull your work together fast. The power to be your best. Apple



MYTH
Networking my Mac
requires extra
hardware and software.

FACT
The Mac has built-in
networking capabilities,
with no hidden costs,
and System 7 adds
file-sharing features.

The programs interact through a StrataVision 3d extension that incorporates the IAC capabilities of MathLink, a communications language built into Mathematica.

You simply select the extension from StrataVision 3d's Modeling menu and enter the appropriate Mathematica commands in a dialog box. (The

extension comes with a variety of predefined equations, which you can modify to meet your needs.)

When you're done, the extension summons Mathematica, which processes the commands and creates the appropriate shape(s). The geometric design is then placed into your StrataVision 3d model, ready for you to add special effects and textures and then render it.



Fast Fact: The Mathematica extension also works with Studio-Pro, Strata's new high-end 3-D modeling program.

19

Creating Cool Icons

Want to amaze your friends and terrify your enemies? Try having Elvis appear on your desktop or making an important folder catch fire. These are just two of the eye-catching options available with Icon 7, the icon editor from Inline Design.

Best of all, you can create your iconic illusions on the fly, without opening an application or doing a copy-and-paste routine. Just install the Icon 7 extension and open the Get Info window for any file, folder, or disk. Triple-click the icon and the Icon 7 editing window will pop up.

Indulge your creativity by editing the existing icon (you can even edit each member of the icon family individually). Or, if you're not a van Gogh, choose a predesigned icon from the existing library. Options range from the practical (custom icons for Excel and StuffIt Deluxe folders) to the whimsical (Elvis, among others).

When you're done, close the editing window and the snazzy new icon will appear on the desktop, ready to catch the eyes of innocent passersby.

Fast Fact: You can have Adobe Photoshop automatically generate a custom file icon for each image file it saves. Just check the Save Preview Icons box in General Preferences.



20

Printing a Disk Directory

Ever wish you had a printout of all the files on your hard disk? It's a snap under System 7, thanks to the Find command and the new outline feature in list views.

First choose the Find command (Command-F) and click the More Choices button. In the resulting dialog box, change the pop-up menus to read "kind contains folder" and click the checkbox labeled "all at once." Choose a hard disk and click the Find button. The search may take a while, but it will select every folder on your hard disk and display them in a list view.

To expand all the levels of all the folders, press Command-right-arrow. Now you can see every file on your hard disk, in outline format, in a single window. Finally, choose Print Window (File menu). Voilà, you have a complete list of your hard disk's contents.

Fast Fact: To close all of the folders at once, type Command-left-arrow.

21

Animating Excel Charts

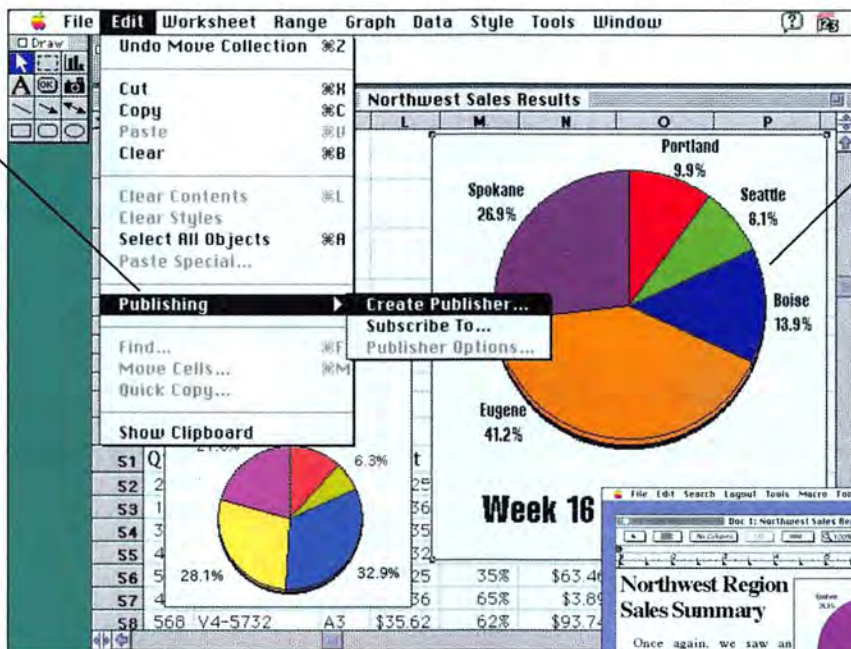
Want to add some pizzazz to your presentations in Microsoft Excel 4.0? You can turn a static chart into a short QuickTime animation by using the Movie Maker utility that comes with Excel.



It's really easy: First open Movie Maker (Macro Library folder). In Excel, select the desired spreadsheet data or chart, choose Create a Movie (Edit menu), and enter your preferences in the dialog box. Click OK and Movie Maker will create and play the animation.

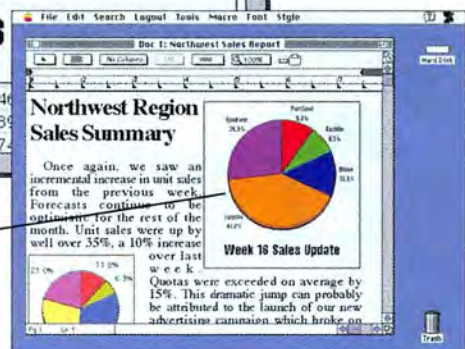
How to make sure your pies are always fresh.

System 7 lets you create "live links" between documents from different applications with a tool called Publish and Subscribe. By "Publishing" a chart from one document, you can "Subscribe To" it and place it in any number of other documents. When you update the original, all the other charts linked to it are updated automatically.



Select the item you want to publish—in this case, a pie chart in your spreadsheet. Go to the Edit menu and choose "Create Publisher." That's all there is to it. Now your chart is ready for you and others to subscribe to.

From your word processing document, select "Subscribe To" in the Edit menu, and you've placed a copy of the chart in your sales summary. When you make changes to the original chart, this new one will be updated automatically to reflect the changes.



Up-to-date documents with System 7.

With System 7™ software and a built-in tool called Publish and Subscribe, keeping reports and documents up to date is as easy as, well, you know what.

For instance, let's say you're working on a sales report in Microsoft Word. Let's also say that you've created a pie chart in a Lotus 1-2-3 spreadsheet showing your company's most recent sales results, and you want to include this chart in your final report.

Experience tells you, however, that these

sales figures will continue to change right up to the very last minute.

No problem. With the Publish and Subscribe feature, you can publish the pie chart from your spreadsheet and then subscribe to it from within your word processing document.

This creates a "live link" between the two. Now, each time you revise the sales figures in your Lotus spreadsheet, the pie chart will automatically reflect the changes. So your final report will always be revised and up to date.



Of course, this is just one of the many ways System 7 can help make you more productive.

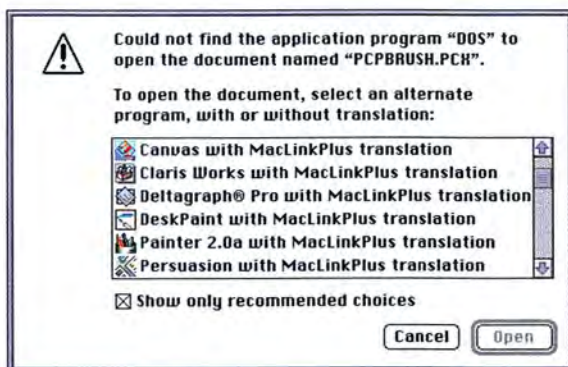
It's also just one of the many reasons why 5 million Macintosh® users are now working with System 7, as well as with the more than 6,000 applications available that run on it.

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And then see how System 7 can give you the power to keep all your ideas fresh. The power to be your best.®



Macintosh Easy Open makes opening documents as easy as any other Mac operation. Combine it with MacLinkPlus/Translators from DataViz and you'll always be able to double-click to open "foreign" documents, regardless of their origins.



WordPerfect PC file into a Microsoft Word or MacWrite Pro document—with all the text formatting intact. Or you could double-click a PICT file from an unknown source and open it directly into Canvas.

To round out its file-translation capabilities, MacLinkPlus/Translators comes with Macintosh PC Exchange, an Apple extension that lets you directly access Windows and MS-DOS files on MS-DOS disks.

You can animate any chart type in one of four animation styles: rotate the chart 360 degrees, add the data points in sequence, add each data series in sequence, or show each data series separately. The animation is saved as a standard QuickTime movie file that you can play back with a QuickTime utility such as MoviePlayer (from Apple).

By animating charts, you can create eye-catching effects for on-screen presentations, such as flying around a 3-D bar chart or showing a chart series growing over time.

22 Universal File Translator

Have you seen the message "application is busy or missing" one too many times? Now you can banish it with Macintosh Easy Open, a System 7 extension that makes opening and converting documents—regardless of their origins—as easy as any other Mac operation.

Whenever you double-click a document that normally couldn't be opened because you don't have the application that created it, Macintosh Easy Open steps in. It locates all applications and file-translation systems—

Office Tracker is an electronic in/out board that uses Apple Events to help you track the many people, places, and things in your office.

such as MacLinkPlus/Translators from DataViz—that can open the file and lists them in the scrolling window of its dialog box. Once you select an alternate application, Macintosh Easy Open transparently manages the conversion of the document into the chosen format.

DataViz has adapted its entire library of 700+ file translators to support Macintosh Easy Open. In fact, the Apple extension comes with MacLinkPlus/Translators, so you'll always be able to double-click to open "foreign" documents, even if they come from MS-DOS, Sun, or Apple II computers.

By combining Macintosh Easy Open with MacLinkPlus/Translators, you can, for example, convert a



23 Keeping Track of Coworkers

Tired of chasing down colleagues for a powwow? Or cooling your heels waiting for the projector or conference room to become available?

You need Milum's Office Tracker, an electronic in/out board that lets you track the many people, places, and things in your work-group or office. Its colorful In/Out Board shows you at a glance who (or what) is In or Out, where they are, and when they'll be back. You can even tell Office Tracker to notify you the minute someone signs back in or returns the office car.



Milum's Main Board									
Tue, Nov 17, 1992 5:19 PM									
In/Out	Type	Name	Info	When	Location	Return	Note		
Out		Carol Reed	x462	10:02 AM	Seminar	4 PM	Tell Sarah		
In		Kelly Hayes	x430	4:02 PM	Office				
In		Ken Ryall							
In		Scott Hayes							
Out		Susan Beaudin				Tomorrow			
Out		HyperCard 2				Tomorrow			
Out		System 7 Inst				Tomorrow			
Out		PowerBook 1				2 PM	Sales Meet		
Out		PowerBook D							
Out		Quadra 950	H578956423	11:45 AM	Ken's Office	Monday, Oct. 5	Testing Ne		
Out		PowerBook 100 Manual		1:27 PM	Scott Hayes	In Two Hours			
In		Quadra 950 Manual	32245211	5:18 PM	Library				
In		Acura Legend	Burgandy	3:18 PM	Space 34				
In		Honda Accord	WY7-9032	1:27 PM	Garage				
Out		Meeting Room 1		11:45 AM	R&D Building	4 PM	Important		
In		Competitive Analysis	Marketing Files	1:58 PM	Marketing Files		Great Info		
Out		Personnel Files	Human Resource	9:23 AM	Carol Reed's Office	Tomorrow			
In		Competitive Selling	SPIN Program	11:45 AM	Library				
In		MacWorld Video	Boston '92	1:58 PM	Library		Check this		
Out		Master Key	R&D Building	8:27 PM					

Making the Move to System 7



Still running System 6.x software? Upgrading to System 7 is easier than you may think. And once you discover how much more productive you are under System 7, you'll be glad you made the move. Here are answers to some commonly asked questions about switching to System 7.

■ System 7.1 is the current version of the Macintosh system software. Released in October 1992, System 7.1 is shipped with all Macintosh CPUs worldwide.

■ System 7.1 requires a hard disk, and we recommend 4 megabytes of RAM. System 7.1 is shipped on 1.4-megabyte floppy disks, but if you don't have a SuperDrive, you can exchange the high-density disks for 800K disks by calling Apple at 800-769-APPL.

■ Individual users can upgrade with the System 7.1 Personal Upgrade Kit (\$99*). To upgrade up to 10 users, you need the System 7.1 MultiPack (\$499*). Both are available from many mail-order and retail outlets; call 800-731-3131, Ext. 500, for the reseller nearest you.

■ Installing System 7.1 requires just one click of the mouse; the Installer program does the rest. In addition to placing the System 7.1 files in their correct locations on your hard disk, the Installer deletes outdated system files and moves third-party extensions, control panels, and fonts into the appropriate folders.

■ Boot your Mac from the System 7.1 Install disk before performing the installation. If you want to run the

Installer from your hard disk, turn off your extensions (INITs) first. You don't have to remove your applications prior to installing System 7.1.

■ Before installing System 7.1, run Compatibility Checker 2.0, which is included in the upgrade kits. This diagnostic tool analyzes your extensions, control panels, and applications, flagging those that should be upgraded. It can automatically move incompatible extensions to a special folder, allowing you to run System 7.1 without mishap. Compatibility Checker 2.0 is also available from on-line services and Mac user groups. On ZiffNet/Mac (the on-line connection to *MacUser*, hosted on CompuServe), you'll find it in Library 14 of the Download Forum (GO ZMC:DOWNTech). The filename is CCHECK.SIT.

If You Already Use System 7.0...

Users of System 7.0 and 7.0.1 can move to System 7.1 by purchasing the System 7.1 Update Kit (\$34.95*), available from mail-order and retail outlets or directly from Apple (800-769-APPL, Ext. 250).

System 7.1 is a minor update. You should get it if you want the enhancements listed below or haven't acquired the System 7 Tune-Up.

What's new in System 7.1? The Fonts folder provides easy installation and centralized storage of TrueType, PostScript, and bit-mapped fonts, and file sharing has improved security settings. Tune-Up has been integrated into the system software, and the QuickTime 1.5 extension is included with the update.

* manufacturer's suggested retail price.

Office Tracker performs these real-time wonders using Apple Events. Each time someone uses his or her "hot" key to sign in or out, the client application sends an Apple Event to the Office Tracker server, which in turn updates the In/Out Board and sends a message to anyone on the network who has requested notification.

If you need to keep colleagues informed of your whereabouts while you're on the road, you can combine Office Tracker with AppleTalk Remote Access to sign in and out from remote locations. Office Tracker also supports the upcoming Apple

Open Collaborative Environment (AOCE), which will allow you to be notified of In/Out changes via electronic mail, pager, or other AOCE messaging service.

24 A Helping Hand

Aldus IntelliDraw offers a variety of innovative tools you can use to simplify the drawing process. But if you forget what an icon in the Tools or Action Buttons palettes does, no

Need help with a program feature or tool? System 7 Balloon Help—shown here with Aldus IntelliDraw—can identify the mystery item and even tell you how to use it.



Arc/Wedge—Use to create arcs. Double-click to switch between pie-wedge and open arc. To create perfect circle-sections, press the Command key while drawing. Initially the arc spans 90-degrees. After drawing, you can freely change the angle-span.

sweat: IntelliDraw is one of the many applications that support System 7 Balloon Help.

Just turn on Balloon Help (Help menu) and move your cursor over the mystery item. A pop-up balloon will identify it and tell you how to use it, saving you the hassle of thumbing through the manual or calling technical support.

Balloon Help is available for nearly everything on the screen, including icons, tools, menu commands, and dialog-box options. It makes IntelliDraw—as well as other programs and System 7 itself—much easier to learn and use.



✓ 25 Great Software on the Cheap

Not all software goodies are commercial products. There's a thriving shareware community that publishes its wares through user groups and on-line services. Shareware programs are usually clever one-trick utilities that would otherwise never see the light of day. You can use them by paying a nominal fee to the author—typically less than \$20.

ColorSwitch, for example, is a control panel that places a monitor icon in your menu bar. Click the icon and a pull-down menu will appear,

allowing you to quickly change the color depth of your screen display. Very convenient.

AliasMenu lets you add custom menus to the Finder menu bar. The menus can contain any kind of item, and selecting an item from an AliasMenu menu will open it.



You could have a menu for applications, another for file servers, and a third for documents. Very cool.

On ZiffNet/Mac (hosted on CompuServe), you'll find these utilities in Library 3 of the Download Forum (GO ZMC:DOWNTech). Look for COSWIT.SIT and ALMENU.SIT.

Here's Our Final Tip: Act Now!

Everyone who uses a Macintosh computer can work faster and smarter with the capabilities provided by System 7. There's never been a better time to upgrade, so contact one of the resellers listed below for some great deals on System 7 software.



THE GENIUS OF FLEXIBILITY

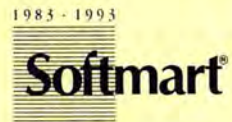
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800-367-4222



800-624-0503



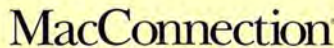
800-395-1000



800-666-2562



800-EGGHEAD



800-800-9520



800-800-5166



800-255-6227



800-443-7359



800-451-7638

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To order system software from the Apple Catalog, call 800-795-1000 (24 hours a day, 7 days a week). International readers can reach Apple by calling 408-996-1010.

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(510) 843-1870 FAX
(510) 843-0906 MODEM
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9. Visus Group

Ken Bendrick
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Pasadena, CA 91105
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(818) 356-9616 FAX
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Tony Miraz/Steve Moore
770 North LaSalle Street, Suite 800
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(312) 337-0150 FAX
(312) 642-4937 MODEM
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(515) 964-3914 FAX
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IRIS 3047 (2)

Image Transform Ltd. offers waterproof, archival, light-fast art prints on a variety of specially manufactured rag papers exhibiting true, rich blacks, accurate colors, and 100% shadow detail. Also available is high-resolution scanning for tiled prints up to 12 x 48 feet, light-fast, rear-lit and front-lit display panels, mounted and laminated. Production IRIS printing at lower than photographic pricing.

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(offering services throughout the U.S.)
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IRIS 3047

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(503) 223-4601 FAX
(503) 223-0314 MODEM
IRIS SmartJet 4012

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UTAH

14. InterWest Graphics, Inc.

Sid Harris
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Lynn Krinsky
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Seattle, WA 98109
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(206) 284-9664 FAX
(206) 285-9665 MODEM
IRIS 3047 (2)

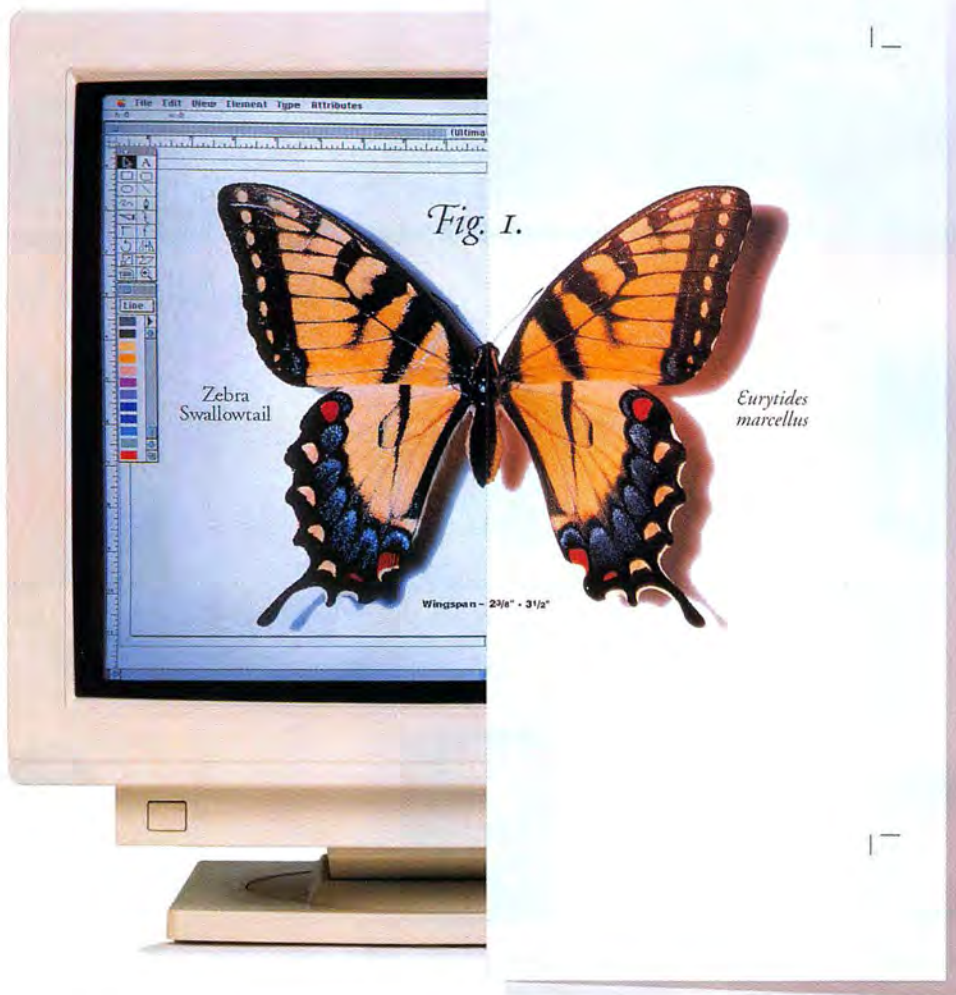
DIGICOLOR is known nationally for quality digital imaging services. Running two IRIS large-format (34"x47") printers, we print on a variety of surfaces including acetate, archival papers, and transite. We also offer drum scanning, large-format printing up to 30 x 50 feet, and professional mounting and laminating services. Meeting your exacting standards and tight deadlines is our priority!



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CIRCLE 93 ON READER SERVICE CARD.

NEW ON THE MENU

Most graphics applications offer more features and complexity than most users can cope with, so Claris (408-727-8227) has launched a new graphics line that's targeted at nonprofessionals.

ClarisDraw, which is due out in early 1994, is the **successor to MacDraw Pro**, and Claris has made a special effort to make its premier drawing package even more accessible in this new version.

Intelligent tools governing shapes, sizes, alignment, connection to other objects, and shadows are additions to ClarisDraw.

When you resize an object with the size tool, for example, other objects in the scene see their relationships with each other and resize appropriately.

Claris has also added bit-map capabilities: ClarisDraw includes a 24-bit-color paint environment, which also features some image-editing capabilities for scanned images.

ClarisDraw's text capabilities are extensive as well. You can bind text to a curve or an object, and you can wrap text around any object. For simple page layout, ClarisDraw includes linked text frames and custom text styles.

ClarisDraw also includes QuickTime support, a presentation environment with basic transitions, a library of 3,000 pieces of clip art, and an outliner.

For those who may find even ClarisDraw more than they need — or not quite right for their business — Claris has created an intelligent graphics package **for business professionals**, which will probably be marketed under the name **ClarisImpact**.

ClarisImpact, which will debut this fall, includes

most of ClarisDraw's intelligence, but with a special focus on business needs. For example, ClarisImpact can automatically generate organizational charts, flowcharts, network diagrams, and time lines. All you have to do is enter the data.

For reports and memos, ClarisImpact includes **robust word-processing capabilities**, with features such as footnotes, multiple columns, and automatic text wrap around objects.


ClarisImpact also includes presentation capability as well as a 3,000-image clip-art library similar to the one that comes with ClarisDraw.

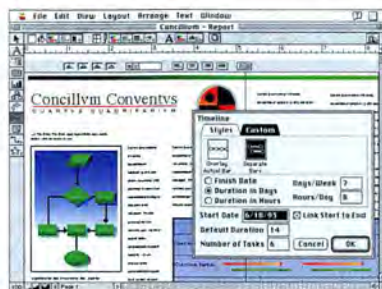
ClarisDraw and ClarisImpact are built on an entirely new graphics engine, but they can also read and write MacDraw-format files. Better yet, the programs are compatible with Macs *and* Windows-based machines, providing a single file format and similar interfaces for both platforms. At press time, pricing was not set for either program.

Up to Date . . .

Affinity Microsystems has launched **TempoEZ**, a recording version of its flagship Tempo II Plus macro maker. TempoEZ offers all the functionality

of Tempo II Plus — without conditional tests or support for external commands. 800-367-6771 or 303-442-4840. \$79.95. WordStar International has introduced two new versions of the **American Heritage Dictionary**: the **Deluxe** version,

with 310,000 words, and the **Standard** version, with a mere 163,000 words. 800-523-3250 or 415-382-8000. Deluxe, \$129; Standard, \$59.95. 



By Russell Ito

Briefcase Printer

Nothing seals a transaction like a printed document, so Apple has introduced a portable version of the StyleWriter to help you put a quick wrap on your business deals — wherever you are.

Called the Portable StyleWriter (great name, huh?), the new printer is basically a StyleWriter I, without the paper-supply attachment, that can run on batteries. It has the same 360-dpi resolution and the same 1-ppm printing speed as the StyleWriter I.

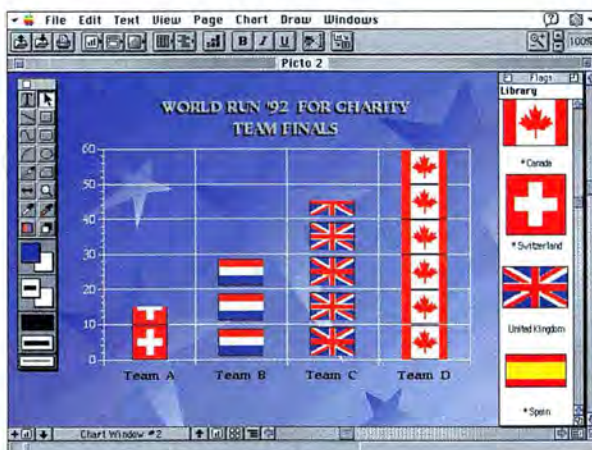
At about an inch wider and three-quarters of an inch shallower than a PowerBook, the printer isn't as compact as GCC Technologies' WriteMove II, and it's only a couple of pounds lighter than a PowerBook. Unfortunately, the Portable StyleWriter uses a unique battery and can't even share any of the PowerBooks' AC power adapters.

Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014; 408-996-1010. \$439.

DeltaGraph, Round 3

For many users, DeltaGraph Professional has become the ideal Excel add-on, and in version 3.0, DeltaGraph Pro has even begun to look like its partner in spreadsheet crime.

Like Excel, DeltaGraph Pro 3.0 includes a tool bar above the window and a fixed status bar at the bottom of the screen. The tool bar contains icon buttons for commonly used functions as well as DeltaGraph-specific commands, such as New Text Page, New Data Page, Plot, and Update. There's even an Excel-like Chart Advisor that guides you through the process of



DeltaGraph Pro and Excel have long been a natural team, and now DeltaGraph Pro 3.0, with a tool bar below the menus and a status bar at the bottom of the window, even looks like Excel.

picking and creating an appropriate chart. The status bar provides information about selected objects and displays on-line help.

DeltaGraph Pro 3.0 allows multiple open documents, and it even lets you select and drag objects such as charts from one window to another without cutting and pasting.

Best of all, DeltaPoint has cut DeltaGraph's list price by \$300, to just \$195 (no, you don't receive a refund for upgrading).

DeltaPoint, Inc., 2 Harris Court, Suite B-1, Monterey, CA 93940; 408-648-4000. \$195.

Radius Real Video

Mac digital-video pioneers have been disappointed with the state of the art. Most full-frame digitizing systems that work at 30 fps (frames per second) use either line doubling or pixel doubling to achieve their performance — at the expense of resolution (as much as 75 percent lower!). What those pioneer producers have been waiting for is true 30-fps, 60-field-per-second, 640-x-480-pixel

digital video, and that's what Radius' VideoVision Studio delivers.

VideoVision Studio is an extension of Radius' earlier VideoVision system. The Studio system includes a daughtercard that clips onto the VideoVision NuBus card, providing hardware-accelerated JPEG compression that yields true 60-field-per-second full-screen video with 24-bit convolution, for flicker-free output to videotape or NTSC display.

Radius, Inc., 1710 Fortune

Drive, San Jose, CA 95131; 800-227-2795 or 408-434-1010. \$4,499.

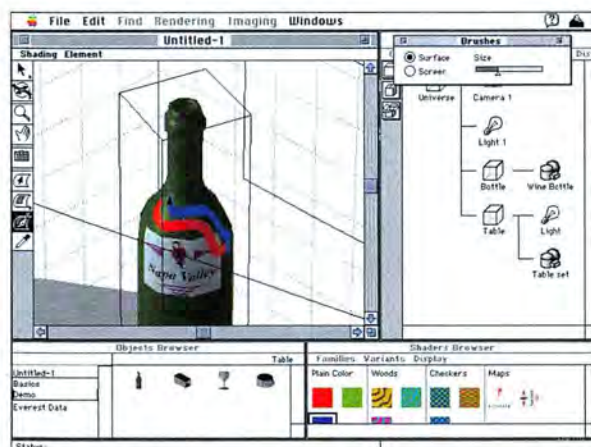
Ray Dream 3.0-D

When Ray Dream slashed the price of Ray Dream Designer to less than \$300 last year, it was news. For the first time, users had access to a sophisticated 3-D-modeling and -rendering tool without having to pay a thousand dollars or more. But Designer was still complex, so in this latest release, Ray Dream has focused on improving the program's integration of modeling and composition and on making Designer easier to use.

Ray Dream Designer 3.0's interface now uses a single environment for modeling and scene composition, so you can create, alter, and position your objects in context.

A new 3-D paint function lets you paint directly on your 3-D objects. When you apply the paintbrush to an object, Designer 3.0 understands the object's geometry and the paintbrush follows the object's contours.

To help users get started, Designer 3.0 includes an



Ray Dream Designer 3.0 consolidates the program's modeling and composition functions into a single environment. A unique 3-D painting tool lets you paint directly on 3-D objects.

editable collection of 3-D clip art that's easily accessible through the program's drag-and-drop interface. To copy a clip-art object into a scene, all you do is select it in the object library and drag it into the scene window.

Ray Dream, Inc., 1804 N. Shoreline Blvd., Mountain View, CA 94043; 800-846-0111 or 415-960-0768. \$299.

Movies, Quick!

Everyone wants to be a QuickTime producer, but unfortunately, QuickTime chews up more CPU cycles than a movie mogul chews cigars. VideoFusion has set out to change that situation with QuickFlix, the first QuickTime editor designed specifically for LC-class machines. The program should cost less than \$100 on the street.

QuickFlix is a specially tuned version of the firm's flagship product, VideoFusion. By removing all the functions that required an FPU, the developer has produced a package that should run acceptably on a 5-megabyte LC III.

Using QuickFlix's storyboardlike interface, you can capture, sequence, and edit movies as well as add basic transition effects and titles. VideoFusion has deliberately limited the number and types of effects in QuickFlix to make the package easier to use and more responsive on low-end machines; even so, you can still layer and tint movies and add pan and zoom effects. You can additionally combine multiple sound tracks.

VideoFusion, 1722 Indian Wood Circle, Suite H, Maumee, OH 43537; 419-891-1090. \$149.

Morph Evolves

Morph, the program that brought dynamic morphing to anyone who had QuickTime, was an instant hit, letting users turn their in-laws into snarling animals with just a few clicks. With Morph 2.0, Gryphon Software has taken the concept further, adding caricaturing and warping to the program.



Morph 2.0 lets you morph moving images and automatically create morphed caricatures of your favorite cultural icons — or anyone else, for that matter.

Morph now works on moving images — and it works even if your images are not the same size. You can also create instant caricatures: Simply by continuing the morph beyond the normal stop point, you can automatically accentuate an image, transforming it into a caricature that's more realistic than a cartoon and more surreal than a photo.

With Morph 2.0's warping effect, you can selectively distort parts of images: turn a smiling face into a frowning one, accentuate a jaw, or make a hairline recede.

Gryphon Software Corp., 7220 Trade Street, Suite 120, San Diego, CA 92121; 619-536-8815. \$239.

NewsLine

Reports and Analysis

Sculley Out as Apple CEO

CUPERTINO, CA — After a decade of leading Apple Computer as the company's CEO, John Sculley announced that he is stepping down from that position and assuming the title of company chairman. Following Sculley's recommendation, the board of directors named Apple's president, Michael Spindler, as Sculley's successor. Sculley will now focus his activities on Apple's emerging business opportunities and on developing business partnerships between Apple and other companies. Sculley will maintain offices in California and on the East Coast.

Apple Suit Dismissed

SAN FRANCISCO, CA — After five long years of legal wrangling, the U.S. District Court in San Francisco has dismissed Apple Computer's "look and feel" copyright-infringement lawsuit against Microsoft and Hewlett-Packard, leaving Apple to continue the fight in a circuit court of appeals. U.S. District Judge Vaughn Walker granted Microsoft's and HP's requests for a summary judgment of dismissal that Apple chose not to oppose. After agreeing to the settlement, Apple announced that it would pursue the case in the appeals courts. Meanwhile, Microsoft and HP announced that they would ask Walker to compel Apple to pay their legal expenses in the case.

Apple Earnings Down, Prices Slashed

CUPERTINO, CA — Although Apple Computer's unit shipments increased 35 percent in the first half of Apple's fiscal year, the company's pricing strategy has meant significantly lower profit margins. Nervous investors battered Apple's stock in early June, and Apple responded with an attempt to reduce overhead through a combination of price cuts and rebates (through September 30) on its slower-moving computers and peripherals. For example, the price for every configuration of the Centris 610 has been cut by \$200 — with an additional rebate of as much as \$300. Apple hacked the PowerBook 180's prices by \$410 in addition to offering a \$100 rebate. If this strategy fails to reduce Apple's overhead and increase its profitability through volume sales, many analysts predict the company will resort to layoffs, as it has in the past.

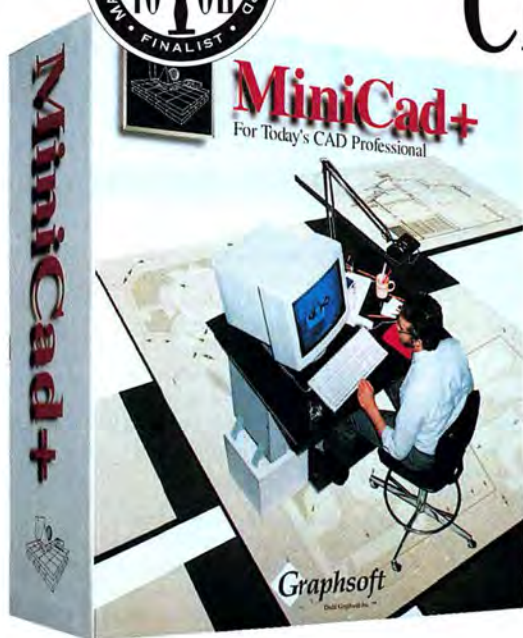
Apple Jumps on a New Bus

CUPERTINO, CA — Future Apple computers will be riding a new bus to expansion. Apple has announced that it will adopt the PCI (Peripheral Component Interconnect) Local Bus architecture in the computers it releases following the initial round of PowerPC models. In adopting the PCI standard, Apple is anticipating its needs for a faster bus with broader bandwidth to accommodate the larger data stream associated with graphics, networking, and video. Ironically, Intel was one of the original developers of the PCI bus standard.

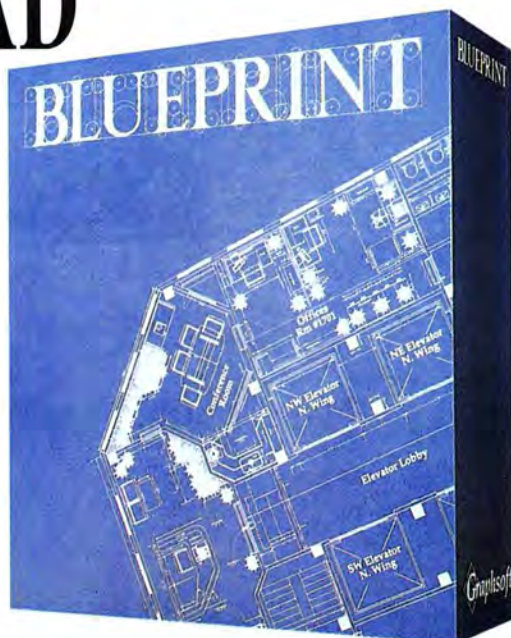
AT&T Buys Eo

MOUNTAIN VIEW, CA — Another giant has stepped into the PDA (personal digital assistant) battle. AT&T recently bought Eo, the developer of the first PDA to actually ship. Eo's product is a clipboardlike device that uses handwriting recognition as its principal interface and offers wireless fax and e-mail capabilities. AT&T previously held a 20-percent stake in the company and chose to increase its investment to 51 percent for an undisclosed amount of money.

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| <input type="checkbox"/> global symbol editing | <input type="checkbox"/> polylines |
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| <input type="checkbox"/> unlimited drawing space | <input type="checkbox"/> export EPSF |
| <input type="checkbox"/> pick-up and put-down attributes | <input type="checkbox"/> free Claris CAD translator |
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| <input type="checkbox"/> auto-insert symbols in walls | <input type="checkbox"/> edit inside groups |
| <input type="checkbox"/> hierarchical symbol library | <input type="checkbox"/> scale by layer |
| <input type="checkbox"/> add & subtract surfaces | |
| <input type="checkbox"/> fractional feet and inches option | |

3D CAD:

- | | |
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| <input type="checkbox"/> mechanical projections | <input type="checkbox"/> 3D reshape tool |
| <input type="checkbox"/> orthogonal or perspective views | <input type="checkbox"/> roof & slab tools |
| <input type="checkbox"/> work in wire-frame or solid | <input type="checkbox"/> 3D smart cursor |
| <input type="checkbox"/> walkthrough and flyover tool | <input type="checkbox"/> auto sectioning |
| <input type="checkbox"/> create 3D view from floorplan | <input type="checkbox"/> multiple view |
| <input type="checkbox"/> sweeps, extrusions & meshes | |

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| <input type="checkbox"/> advanced auto-dimensioning | <input type="checkbox"/> beziers |
| <input type="checkbox"/> editable line styles | <input type="checkbox"/> wall-join |
| <input type="checkbox"/> pan by scroll bars | <input type="checkbox"/> chamfers |
| <input type="checkbox"/> color by object only | <input type="checkbox"/> tolerancing |
| <input type="checkbox"/> DXF translator - extra charge | <input type="checkbox"/> 9 saved views |
| <input type="checkbox"/> unlimited layers | <input type="checkbox"/> hatching |

3D CAD:

none

Integrated Database/Spreadsheet:

none

Programmability:

none

Blueprint 4 \$ 295.00

2D CAD:

- | | |
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| <input type="checkbox"/> smart walls | <input type="checkbox"/> fillets |
| <input type="checkbox"/> Smart Cursor for locating snaps | <input type="checkbox"/> editable fills |
| <input type="checkbox"/> advanced auto-dimensioning | <input type="checkbox"/> beziers |
| <input type="checkbox"/> editable line styles | <input type="checkbox"/> wall-join |
| <input type="checkbox"/> pan by scroll bars or hand | <input type="checkbox"/> chamfers |
| <input type="checkbox"/> color by object or layer | <input type="checkbox"/> tolerancing |
| <input type="checkbox"/> DXF translator - free | <input type="checkbox"/> unlimited saved views |
| <input type="checkbox"/> unlimited layers | <input type="checkbox"/> hatching |
| <input type="checkbox"/> global symbol editing | <input type="checkbox"/> on-line prompts |
| <input type="checkbox"/> polylines | <input type="checkbox"/> export EPSF |
| <input type="checkbox"/> unlimited drawing space | <input type="checkbox"/> scale by layer |
| <input type="checkbox"/> file compatible with MiniCad+ | <input type="checkbox"/> classes |
| <input type="checkbox"/> fractional feet & inches option | <input type="checkbox"/> round wall caps |
| <input type="checkbox"/> auto-insert symbols in walls | <input type="checkbox"/> edit inside groups |
| <input type="checkbox"/> hierarchical symbol library | |
| <input type="checkbox"/> add & subtract surfaces | |
| <input type="checkbox"/> pick-up and put-down attributes | |

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The Macintosh CAD People

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Electric Paper: Adobe Acrobat



The paperless office. You've heard of it. Computers were going to make paper obsolete. They were going to make it possible to distribute, read, revise, and annotate documents on-screen. Major consumers of paper, such as business and government, were to enjoy dramatic cost savings (not to mention saving some trees).

The only trouble was, it didn't happen.

Annual proclamations of the year of the electronic office notwithstanding, most organizations still wallow in paper. The document-display technology that is needed to make large-scale distribution of electronic documents feasible simply hasn't existed.

What's the hang-up? No standards, for one. Currently, hundreds — perhaps thousands — of commercial applications exist for creating text and graphics documents on several platforms, resulting in almost as many formats for storing said documents. TrueType fonts rule on one computer, Type 1 PostScript fonts hold sway on another. Windows uses GDI for graphics display, the Mac operating system uses QuickDraw, UNIX uses X Window, and DOS barely knows what a graphic is. Although translators exist to convert, for example, a document created in WordPerfect on a Windows-based machine to a format that Microsoft Word can read on a Mac, the translation process is often burdensome

and inaccurate. When you add graphics to the mix, things can go haywire if you so much as look at your screen sideways.

Adobe thinks that it has found a solution to these problems. The company has been promoting the idea of portable digital documents for a couple of years, and now it's finally ready to

ship its Acrobat (formerly called Carousel) technology, which it believes will provide the tools that will make these portable documents practical. Leveraging its PostScript page-description language, Adobe has designed a document-format standard called PDF (portable document format) and a collection of software products that are capable of creating, reading, navigating, annotating (although not editing), and printing PDF files. Adobe Acrobat will be available initially on Macintoshes and Windows-based computers; it should also be available for UNIX- and DOS-

based machines late this year.

Acrobat comprises four main components: multiple-master fonts, PDF readers, printer drivers, and PostScript distillers.

Multiple-Master Fonts

One of the biggest barriers on the road to digital documents is font incompatibility. You create a document that uses a group of typefaces from the Goudy family. You send it to a

*Adobe makes
electronic
documents a
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By Henry Bortman

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NEW ON THE MENU **SNEAK PREVIEW**

Original fonts

Times Roman
Helvetica Condensed Light
Adobe Garamond
LITHOS BLACK

Multiple-master simulations

Some fonts, such as Times Roman and the Helvetica family, are reproduced quite effectively by Acrobat's multiple-master technique.

Times Roman
Helvetica Condensed Light
Adobe Garamond
LITHOS BLACK

Fonts such as Lithos, however, lose a great deal of their distinctive character.

When a document has characters (such as swash characters or small caps) from expert-set fonts or ones from symbol fonts (such as Carta), Acrobat embeds the font's character outlines directly into the PDF file. That's why, in this sample, the initial-swash capital letters (Adobe Garamond Expert Italic) are reproduced more faithfully than the lowercase letters (Adobe Garamond Italic).

Figure 1: Acrobat uses two multiple-master fonts, Adobe Sans X and Adobe Serif, to simulate a wide variety of typefaces.

friend. Even though she has the application you used to create the document, the document looks completely different on her machine, because she doesn't have Goudy fonts installed. If she's lucky, the document displays and prints in Times Roman; if she's not so lucky, it appears in Courier. The spacing is all off. The line breaks are different. It's a mess.

Adobe uses its multiple-master fonts to overcome this limitation. These multiple-personality fonts are not a new technology (see "The Future of Type?" July '91, page 187). Multiple-master fonts can generate several typefaces, each with a different width (condensed, regular, or wide) and weight (light, roman, bold, or black). This makes them good candidates for use in font substitution.

Acrobat ships with two multiple-master fonts, Adobe Sans X and Adobe Serif, and a new version of ATM (3.6) that is capable of using them for font substitution. Using just these two fonts, Acrobat can mimic the general appearance of practically any font available. What's most impressive is the precision with which Acrobat preserves character spacing. For standard text and simple display faces, these multiple masters can also do a pretty good job of mimicking the appearance of the original fonts (see Figure 1). They do less well with typefaces that have highly distinctive personalities, such as Adobe's own Lithos family.

An option in Acrobat Distiller (discussed later in this article) allows you to

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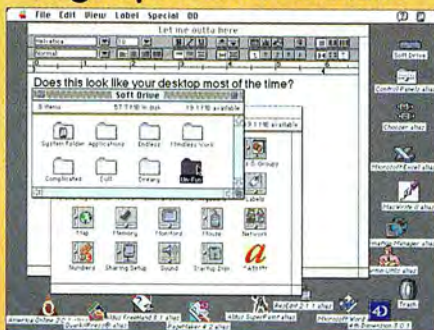
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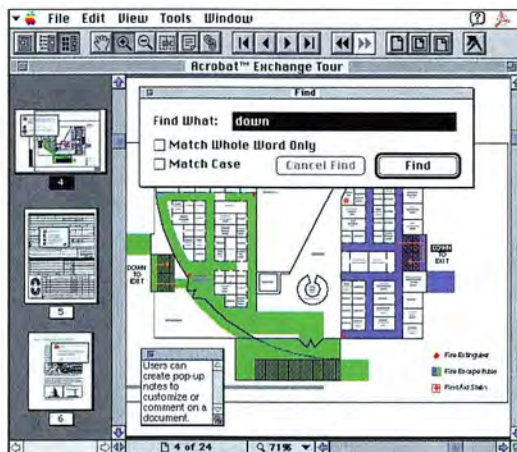


Figure 2: Acrobat Exchange provides a window for viewing PDF documents and a set of navigational tools, including forward and backward arrows and page thumbnails, for moving around in documents. Users can also create arbitrary links to jump directly from any page to any other page and can search for any text string in a document. By adding pop-up notes, users can attach comments to an Acrobat document.

selectively embed fonts in your PDF files, but you have to put on your programmer's hat and hack a PostScript file to use the option. Not the world's most elegant solution. (There's always version 2.0...)

PDF Readers

Adobe will offer two programs, Acrobat Exchange and Acrobat Reader, for reading PDF files. Exchange lets users read any document in PDF format, regardless of the platform and the application with which it was originally created. In this case, *read* means viewing fully formatted text and faithfully rendered graphics, both bit-mapped and outline (see Figure 2).

Exchange also provides several tools for navigating through a document. The tool bar contains arrows for paging forward and backward and for fast-forwarding or reversing to the first or last page of a document. Other tools let you retrace the path you take from page to page as you peruse a document. In addition, you can create bookmarks (to mark specific pages), thumbnails (postage-stamp views of a document's contents), and custom links (buttons that instantly take you from one page to another). Zoom tools let you enlarge a page to see the details or reduce it to see its overall layout. The program's use of multiple-master outline fonts ensures smooth text regardless of how closely you zoom in.

Exchange doesn't let you edit the text

of documents: Its intent is to provide a means of reading documents, not modifying them. It does, however, contain a find tool that lets you search for individual words anywhere in your document. In version 1.0, unfortunately, this tool lets you hunt only for single words, not for phrases. Exchange also provides an annotation tool for creating pop-up notes you can attach anywhere on a document.

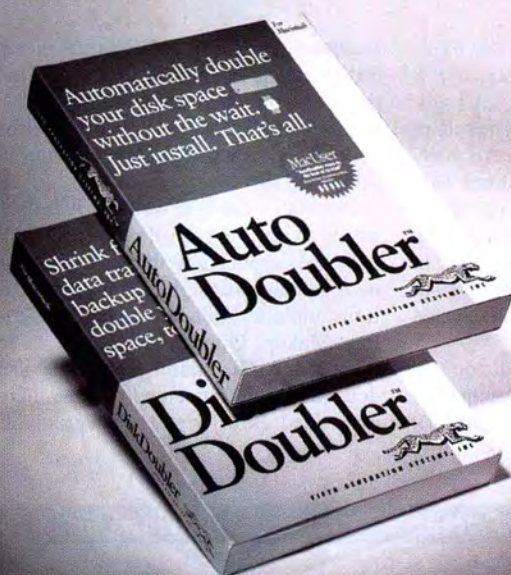
Acrobat Reader is nearly identical to Exchange. The main difference is that Reader doesn't allow users to add pop-up notes to documents or to create custom links. There's also a marketing difference: Exchange will be available for retail purchase by individual users; Reader will be available only in packs of 50 or more.

Printer Drivers

You can create a PDF file in two ways: You can print your document to a PostScript disk file and run it through Acrobat Distiller, or you can use a special printer driver. For the Mac, Acrobat Exchange will ship with a driver called PDFWriter, which installs in your Extensions folder just like any other Chooser printer driver. Using a special printer driver, such as PDFWriter, is by far the simpler approach (see Figure 3).

To create a PDF file by selecting the PDFWriter driver, you use the standard

Adobe will offer two programs, Acrobat Exchange and Acrobat Reader, for reading PDF files.



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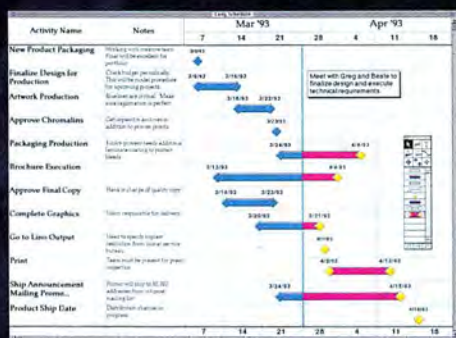
Inspector									
File Name	Original	Compressed	Saved	Status	Creator	Type	Label	Last Modified	
1992 Year-end Report	10.0K	5.9K	42%	Compressed Faster	HSVD	VGEN	None	Fri, Jan 29, 1993	
Current Newsletters	12.5K	19.5K	69%	Compressed Faster	SOBO	CVE	None	Thu, Feb 25, 1993	
Handbook	45.5K	9.4K	79%	Compressed Smaller	FWA3	EPSP	None	Thu, Aug 27, 1992	
Newsletter, Jan 93	100.2K	25.4K	75%	Compressed Smaller	ALD4	ALB4	None	Fri, Sep 11, 1992	
Product Descriptions.doc	254.7K	—	—	Archived	NCI2	APPL	None	Thu, Feb 25, 1993	
Q1 '93 Objectives	6.5K	—	—	Don't Compress: Item	HSVD	VGEN	None	Mon, Feb 1, 1993	
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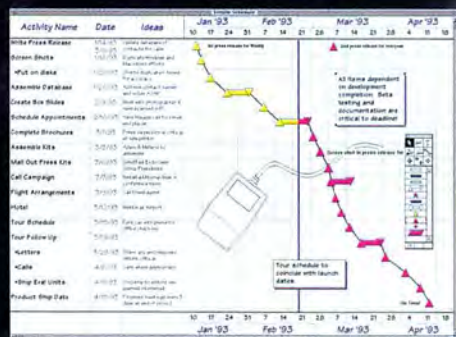
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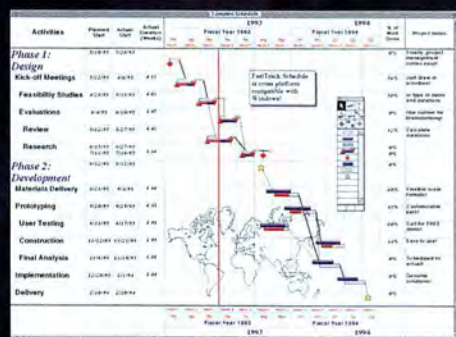
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Print command. If you select the PDFWriter driver from the Chooser, it will become the "permanent" driver: All subsequent Print commands will result in PDF files, not printed output. An alternative is to hold down a modifier key, such as the Control key, when you select Print from the File menu. This brings up the PDFWriter Print dialog box for that one print job only, leaving as permanent whatever other printer driver you selected in the Chooser.

The PDFWriter Page Setup dialog box lets you specify the size and orientation of your PDF document (see Figure 4).

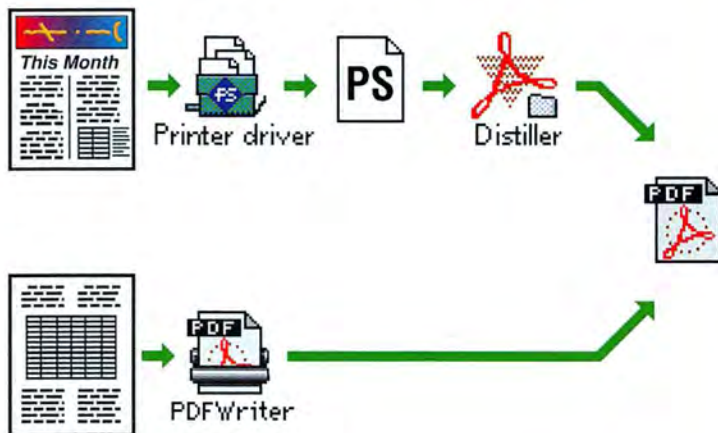
Custom sizes are possible. From the Page Setup dialog box, you can invoke the PDFWriter Compression Options dialog box, which gives you a variety of choices for compressing the text and graphics in your PDF files.

Ironically, the PDFWriter driver does not do a very good job of producing PDF files from applications that generate their own custom PostScript. These applications include Aldus FreeHand, Aldus PageMaker, QuarkXPress, and even Adobe's own Illustrator. The driver also does poorly with documents containing embedded PostScript (EPS) graphics.

Figure 3: Creating Portable Document Format Files

Using Acrobat Distiller

If your application generates its own PostScript, you must filter your documents through Acrobat Distiller, in a two-step process, to ensure good results. In the first step, you select the print-to-disk-file option within Apple's LaserWriter driver — version 7.x or 8.0 is required — or Adobe's PSpinter 8.0 driver to create a PostScript disk file. In the second step, you open this PostScript file in Acrobat Distiller, which converts it to a PDF PostScript file that Acrobat Exchange can read.



Using the PDFWriter Printer Driver

By printing to the PDFWriter printer driver, users can create a PDF file directly from any application. Much like the Mac's LaserWriter driver, the PDFWriter driver receives QuickDraw commands from applications and converts them to PostScript. However, some applications, such as FreeHand, Illustrator, PageMaker, and QuarkXPress, generate their own PostScript, using QuickDraw only for displaying to the Mac's screen. Such applications may yield unacceptable results with the PDFWriter driver.

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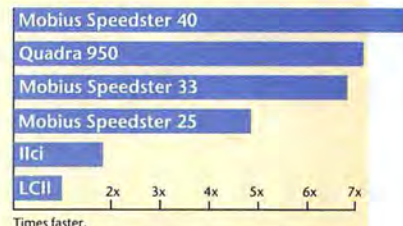
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That's because the PDFWriter driver expects applications on the Mac to output QuickDraw descriptions of document pages. And most applications do. But those that roll their own PostScript, such as the Big Four just mentioned, use QuickDraw only to create low-resolution bit maps for screen display. Using PDFWriter with such applications can result in PDF files that have jagged text, grainy graphics, and big blocks of white space where something other than white was supposed to be.

PostScript Distillers

That's where Acrobat Distiller comes in. Distiller's job is to take a PostScript file, no matter how it was created, and convert it to a PDF PostScript file that is capable of being read by Acrobat Exchange or Acrobat Reader. This is a two-step process. First, users must print their documents to a PostScript disk file, using Apple's LaserWriter driver 7.x or 8.0 (or Adobe's PSpriinter 8.0 driver, which is identical to LaserWriter 8.0).

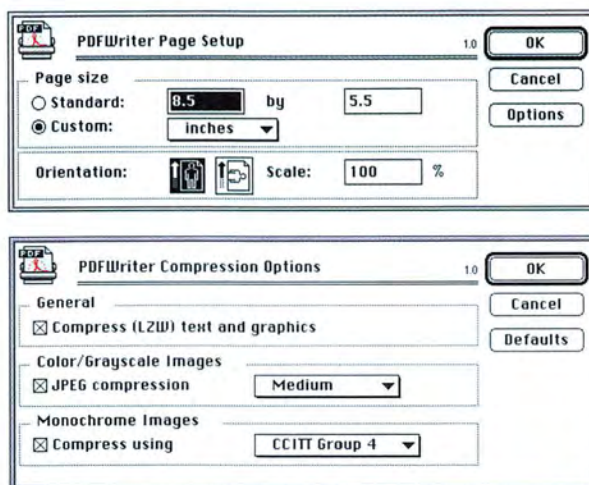


Figure 4: The PDFWriter Page Setup dialog box (top) lets users set custom page sizes for the Acrobat documents they create. The PDFWriter Compression Options dialog box (bottom) offers choices of compression methods for text and various types of graphics.

Then they open the resulting PostScript file in Acrobat Distiller, which converts it to PDF-style PostScript.

This method is more tedious and time-consuming than using PDFWriter, but it is the only way to achieve consistently

good results with documents from the four above-named applications.

Distiller comes in single-user and network versions. The network version can "watch" several folders and automatically convert any PostScript file placed

YOU CAPTURE THE IMAGES



in a watched folder into a PDF file. Several users can mount a shared volume from a computer running Network Distiller and get their files converted to PDF files simply by dropping them into the folder. This method takes the burden of performing the conversions — and the extremely high RAM and disk-space demands of Distiller — off individual users' machines.

The Price of Progress

The pricing for Acrobat products is as follows: Exchange, \$195 for a single user, ranging to \$14,625 (\$146 per seat) for a 100-user pack; Reader, \$2,500 for a 50-user pack (\$50 per seat), ranging to \$17,500 (\$35 per seat) for a 500-user pack; Distiller, \$695 for the Personal version (single user), \$2,495 for the Network version (unlimited users). All these products should be available for Macs and Windows-based machines by the time you read this.


But watch out! Hidden costs may be lurking. Exchange requires 2 megabytes

of application RAM. Application RAM is what's left over *after* your system takes what it needs. If you're running System 7, your system will probably eat up close to 2 megabytes by itself — and can consume significantly more if you use a lot of extensions and control panels. On a 4-megabyte System 7 machine, you're practically guaranteed not to be able to run any other application at the same time as Exchange. But it gets worse: Adobe recommends that you give Exchange 4 megabytes of application RAM.

Still, that's lightweight compared with Distiller, which requires 6 megabytes of RAM (Adobe recommends 12).

Remember that most well-designed desktop-published documents — likely candidates as source material for PDF files — are probably created in one of the Big Four generate-their-own-PostScript applications: FreeHand, Illustrator, PageMaker, or QuarkXPress. And you must have Distiller to create decent-quality PDF files from documents created with these applications. So you can

see why you might want to run Distiller on a network. (By the way, Adobe recommends Ethernet.)

Even leaving Distiller aside, one can't help but wonder how quickly Acrobat is going to catch on. Adobe has performed a significant technological feat. It has indeed made fully formatted digital documents possible across platforms and has provided an excellent set of tools for creating and viewing those documents. But although there's a lot going on under the hood with these tools, 2 to 4 megabytes is a great deal to ask of a user who just needs to look at a document now and then. Users' reluctance to spend money on RAM upgrades was one of the big hurdles that prevented faster adoption of System 7. Are managers going to be willing to spring for another couple of megabytes each for hundreds or thousands of users in order to bring Acrobat on-line? Especially when lower-cost alternatives such as No Hands' Common Ground (\$189.95) offer far-less-RAM-demanding alternatives? 

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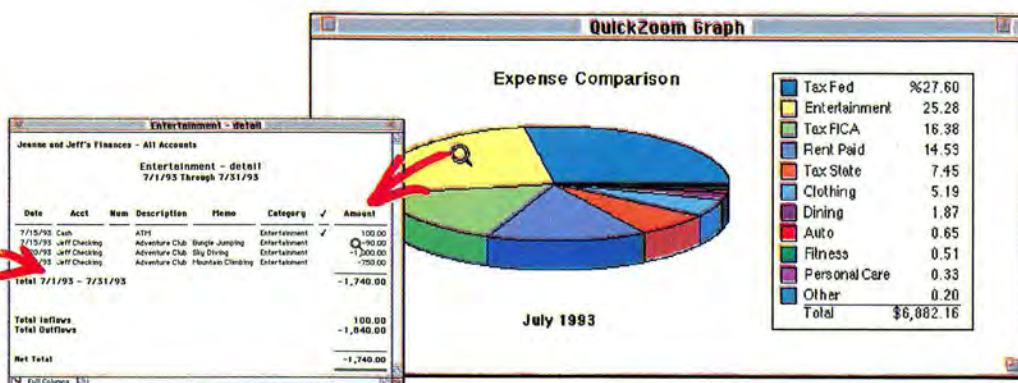
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2	248.34	65.02	9,504.97	131.69
3	249.99	63.37	9,254.98	195.06
4	251.66	61.70	9,003.32	256.76
5	253.34	60.02	8,749.98	316.78
6	255.03	58.33	8,494.95	375.11
7	256.73	56.63	8,238.22	431.74
8	258.44	54.92	7,979.78	486.66
9	260.16	53.20	7,719.62	539.86
10	261.90	51.46	7,457.72	591.32
11	263.64	49.72	7,194.08	641.04

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Annual Yield: 9.00%

Current Tax Rate: 28.00%

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Predicted Inflation: 4.00%

Retirement Info

Retirement Income: 7,771.11

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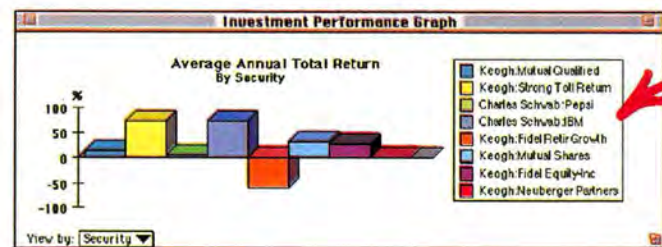
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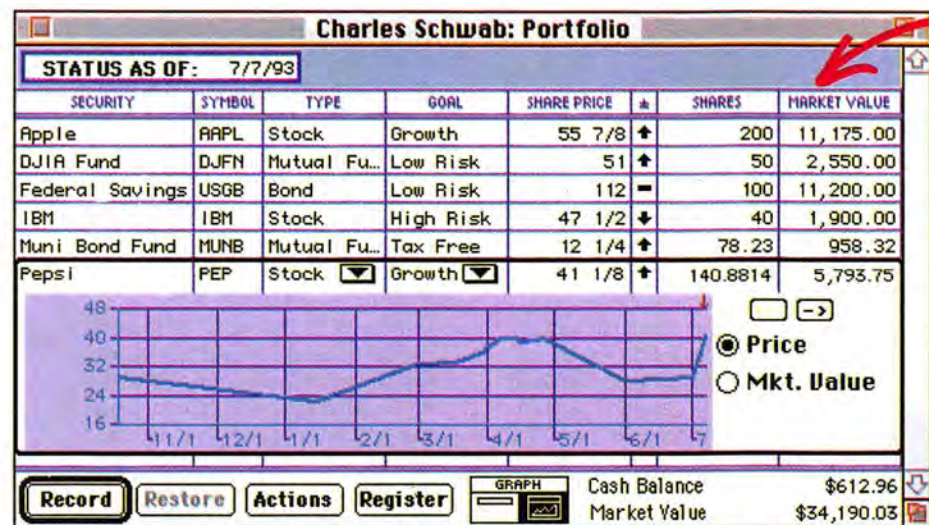
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graphs

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OUTPUT DEVICES

Hewlett-Packard LaserJet 4ML

Compact and affordable, HP's new personal PostScript printer goes to the head of its class.

What's only *slightly* bigger than a bread box and the best buy you can find among personal PostScript printers? The Hewlett-Packard LaserJet 4ML, that's what. This new 300-dpi pint-sized featherweight laser printer is street-priced at less than \$1,000. And although the price is low, print quality and speed are anything but. The 4ML delivers outstanding print quality for the price, bests its advertised rating of 4 ppm (pages per minute), and outclasses Apple's comparably priced Personal LaserWriter NTR in most areas.

Personal Best

The first thing you notice about the \$1,279 HP LaserJet 4ML is its size. Measuring only 14.5 inches deep, 14

Hewlett-Packard LaserJet 4ML
 Manufactured by: Hewlett-Packard Co., 5301 Stevens Creek Blvd., MS 511L-SJ, Santa Clara, CA 95051; 800-752-0900 or 408-725-8900.
 List Price: \$1,279.

with an installer that places fonts, drivers, and the printer's utility program in their correct places. To connect a LocalTalk cable (which you purchase separately) and power cord to the printer, you have to remove several side panels — an unusual arrangement that initially had us scratching our heads. In the end, however, we discovered the method in HP's madness — this design keeps cables firmly connected as you move this *very* portable printer around.

Once you've installed the software and connected the 4ML to your Mac, you use the Chooser to select the printer. The Setup option allows you to select the correct PPD (PostScript Printer Description). The entire installation takes only a few minutes.

The printer comes with the standard set of 35 PostScript Type 1 fonts for the Mac. Although the *M* in 4ML stands for *Macintosh*, the printer also comes with the necessary printer drivers for PCs running Windows. The Windows installation disks supply an attractive set of typefaces comprising 35 Intellifont PCL fonts and 10 basic TrueType fonts.

Out of the box, the 4ML comes equipped with 4 megabytes of RAM and both a LocalTalk and a Bi-Tronics parallel port. Although the printer is clearly designed for personal use, it does provide networking features — automatic switching between the two

ports as well as between the printer's built-in PostScript Level 2 and PCL 5 languages.

Speedy Performer

The 4ML boasts an Intel 80960 20-megahertz RISC processor that makes it speedy for PostScript printing. It also comes with HP's proprietary RET (Resolution Enhancement Technology) and MET (Memory Enhancement Technology). RET improves the output quality of text by reducing jaggedness; MET enables the printer to handle large print jobs, such as full-page graphics, with a small amount of RAM. The latter operates only in PCL 5 mode — it doesn't work with PostScript. Nevertheless, we encountered no memory-related problems when printing large PostScript jobs, so most Macintosh users will find the printer's standard 4 megabytes of RAM sufficient.

With the printer's utility program, you control various functions, such as downloading fonts and files and printing font lists and samples. The utility also provides controls for the 4ML's EconoMode — a special toner-saving printing mode that's the equivalent of draft mode — as well as access to language-switching options and print-density settings.

The utility gets the job done, but we have one complaint. It would be far more convenient to access several features — print-density settings; RET controls; and most especially, EconoMode — from the Print dialog box. EconoMode reduces the amount of toner used for each



The HP LaserJet 4ML is a little printer with big value. Street-priced at less than \$1,000, it delivers PostScript Level 2 support, impressive output quality, and surprising speed for a 4-ppm printer.

inches wide, and 6.5 inches high, the diminutive printer is ideal for the home as well as for offices where space is at a premium. Moreover, the 4ML weighs in at a scant 15.5 pounds (the original Mac Portable tipped the scales at a hefty 16 pounds!), making it one of the most mobile PostScript printers around.

Setup is a snap — the 4ML comes

6pt
 ABCDEFGHIJKLMNOPQRSTUVWXYZ
 abcdefghijklmnopqrstuvwxyz

10pt
 ABCDEFGHIJKLMNOPQRSTUVWXYZ
 abcdefghijklmnopqrstuvwxyz

The HP 4ML features a toner-saving EconoMode, which produces quite legible type, even at small point sizes.

print job by 50 percent, making it a valuable toner- and money-saving option. We'd like to be able to turn this option on and off without having to resort to a separate utility — the added step almost guarantees that most users won't use EconoMode as much as they would if they had more-convenient access to its controls.

The 4ML features intelligent power consumption. It has no on/off switch, but it switches automatically to a silent, dormant mode if it doesn't detect any activity for 15 minutes. In this state, the 4ML consumes only 5 watts per hour. This arrangement not only eliminates warm-up time but also makes it possible to keep a set of downloaded fonts stored in the printer's memory.

Paper handling is adequate, but there's room for improvement. A 100-sheet paper tray handles most common sizes of paper (letter, legal, A4). Envelopes, label sheets, and transparencies, however, must be handled manually, one page or envelope at a time. We had no problems printing envelopes, but the printer doesn't supply a manual-feed output tray — media simply drop out of the back of the printer. And manual printing is more complicated than it should be. In addition to selecting the manual-feed option in the Print dialog box, you must flip a switch on the back of the printer and then remember to flip it back to automatic feed when you've finished. A one-button, four-light front control panel keeps you informed of printer activity and problems and lets you reset the printer.

The 4ML's \$85 toner cartridges are rated at 3,000 pages each. Further enhancing the quality of the output, the

cartridges use a microfine toner with particles 20 to 30 percent smaller than those in other cartridges. HP claims the smaller particles result in less toner scatter during printing.

For our tests of the 4ML's print quality and speed, we compared it with the \$1,179 Apple Personal LaserWriter NTR. The NTR was a top performer in the personal-printer class of the special report on laser printers in this issue (the 4ML was released too late to be included in the testing for that report). Our test platform was a Mac IIcx equipped with 8 megabytes of RAM, running System 7.1. The test files comprised a 10-page Word document, two Adobe Photoshop gray-scale documents, and type samples in sizes from 6 to 48 points.

For gray-scale processing, the 4ML's 20-megahertz Intel processor breezed by the NTR's 16-megahertz AMD Am29005 RISC processor. The 4ML took 2 minutes, 38 seconds compared with the NTR's 3 minutes, 40 seconds to process a 132-dpi full-page gray-scale document. The output quality was virtually identical for both printers, although gray ramps in the test document showed slightly more banding with the NTR.

Type samples showed the 4ML capable of producing crisper, cleaner type than the NTR, especially at small point sizes. The differences weren't as noticeable with larger (48-point) display type, although in general, the 4ML produced more pleasing results.

Our ppm tests showed that the 4ML actually exceeds its official 4-ppm rating — we clocked it at 5 ppm. The NTR met its advertised 4-ppm rating.

We did notice a slight amount of paper curl in the 4ML's output, but the



The HP 4ML produces excellent gray-scale output for a 300-dpi printer, and it's faster than the Personal LaserWriter NTR at printing gray-scale documents.

problem was so minor that it didn't affect our overall favorable opinion of the printer.

The Bottom Line

If a personal PostScript printer seems an extravagant luxury beyond your reach, the HP LaserJet 4ML may get you to change your mind — it's a truly affordable personal printer with impressive price/performance advantages. Compact, light, and reliable, the 4ML delivers PostScript Level 2 support, high speed for a 4-ppm printer, and sharp output — all street-priced at less than \$1,000. Who could ask for more?

— Gregory Wasson

6pt
ABCDEF GHIJ KLMNOPQRSTU VWXYZ
abcdefghijklmnopqrstuvwxyz

10pt
ABCDEF GHIJ KLMNOPQRSTU VWXYZ
abcdefghijklmnopqrstuvwxyz

12pt
ABCDEF GHIJ KLMNOPQRSTU VWXYZ
abcdefghijklmnopqrstuvwxyz

6pt
ABCDEF GHIJ KLMNOPQRSTU VWXYZ
abcdefghijklmnopqrstuvwxyz

10pt
ABCDEF GHIJ KLMNOPQRSTU VWXYZ
abcdefghijklmnopqrstuvwxyz

12pt
ABCDEF GHIJ KLMNOPQRSTU VWXYZ
abcdefghijklmnopqrstuvwxyz

The 4-ppm LaserJet 4ML produces impressively sharp, clean type. Shown here is a sample of output from the 4ML (left)

side by side with output from the comparably priced Apple Personal LaserWriter NTR (right).

WORD PROCESSING

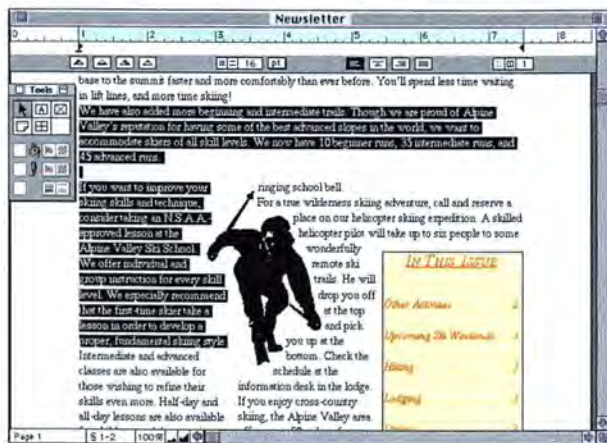
MacWrite Pro

Claris throws its hat back into the word-processing ring with the new page-layout-capable MacWrite Pro.

The long-awaited upgrade to Claris' veteran word processor fairly sparkles with new features. MacWrite Pro successfully narrows the yawning gap that separated its predecessor, MacWrite II, from competing packages. Nevertheless, MacWrite Pro faces a fierce uphill battle for its share of the Mac word-processing pie. Squeezed at the low end by the growing versatility of integrated software, such as its own elegant cousin ClarisWorks, and elbowed at the high end by word processors that are more powerful and feature-rich, late-comer MacWrite Pro may have trouble finding a seat at the table, despite its welcome new features.

Bargain-Priced Page Layout

By far the most notable MacWrite Pro enhancements are the program's page-layout features. For starters, MacWrite



The most notable enhancements to MacWrite Pro are in the area of page layout. The program features support for variable-width columns, text-frame sidebars, and text wrap around irregularly shaped objects. You can also add Post-it-style notes to documents.

Pro supports column formatting. You can quickly add and delete columns simply by clicking on controls on the text ruler. And by dragging column borders, you can just as easily create variable-width columns.

MacWrite Pro 1.0v1
Published by: Claris Corp., 5201
 Patrick Henry Drive, Santa Clara,
 CA 95052; 408-727-8227.
List Price: \$249.

The program also lets you organize your documents into sections. Each section can have a different format, which makes it easy to incorporate various column formats, header and footer text, and page-numbering methods into the same document.

A major aspect of MacWrite Pro's page-layout capabilities is the program's use of frames. By inserting frames into documents, you can create text boxes, picture frames, tables, and notes. The floating Tools palette provides quick access to each of the four frame tools.

To create newspaper-style sidebar frames, you use the text tool. Text automatically wraps within frames unless you select Auto-resize Frame, in which case MacWrite Pro expands the frame vertically to accommodate more text. Text frames don't support columns or footnotes. With the picture tool, you can place imported graphics within frames. Once you've placed a graphic, you can move it within a frame, crop it, or enlarge or reduce it. The note tool lets you attach annotations to documents; you can then collapse or hide the annotations. Note frames

can even include recorded sounds. MacWrite Pro's table tool is especially impressive, making table creation a snap. Once you've created a table, you can modify it in a variety of ways with Table menu commands — for example, you

can insert rows and columns and merge, split, and sort cells. The range of MacWrite Pro's table options is easily on a par with that of Microsoft Word.

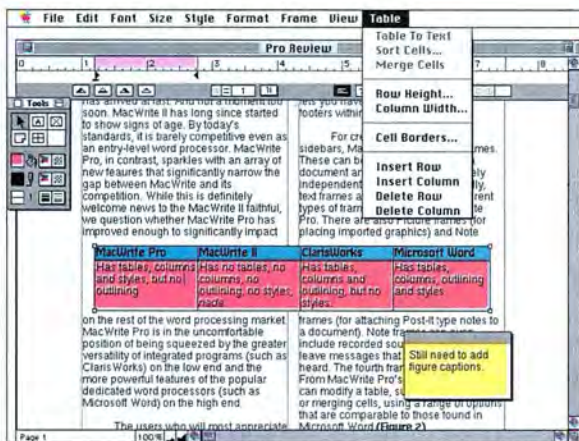
Once you've created a frame, MacWrite Pro provides lots of flexibility for placing it in a document. When you insert a frame into existing text, for example, you can specify how it affects text flow. You can wrap text around the frame, insert the frame into a line of text, or place the frame on top of text. In each case, you have the option of making the frame opaque or transparent. When the frame is opaque, you can wrap text around the rectangular frame itself, and by making the frame transparent, you can wrap text around irregular shapes within the frame.

MacWrite Pro even lets you anchor frames to a specific location on a page or anchor them to text, so they move with the text as you make changes to your document. Finally, the program provides a limited set of graphics tools for adding borders and backgrounds to frames — in color, if you want.

Word Processing with Styles

In addition to using frames to enhance its page-layout capabilities, MacWrite Pro features Styles commands. You can create separate style definitions for paragraphs (margin settings, tabs, indents, spacing) as well as for characters (font, style, size). Paragraph styles are able to include character formatting as part of their definition.

Unlike with the static character styles used by predecessor MacWrite II, modifications to a style definition are immediately reflected in all existing text formatted with that style. By having this critical feature, MacWrite Pro plays catch-up with all the other leading word processors. However, MacWrite Pro's styles implementation is the easiest to work with, thanks to its Styles palette, which not only maintains a list of all currently defined styles but also provides its own menu bar for instant access to



MacWrite Pro makes it easy to create good-looking tables, complete with colored backgrounds. With the Table menu, you can modify the number of cells and their formats.

most style-related commands.

Its strengths aside, MacWrite Pro's implementation of styles has a few inconvenient quirks. When you change the style for a selected paragraph, the paragraph doesn't reflect the new character formats for the selected style (plain text to bold, for example) unless you first highlight the complete text of the paragraph *before* changing the style. An even more critical oversight is that MacWrite Pro's Find/Change command lacks the ability to search for text based on style definition.

Other noteworthy enhancements to MacWrite Pro include the Document Info command, which is useful for generating word counts for entire documents or selected passages, and support for publish-and-subscribe.

Even with all these new features, MacWrite Pro retains the simplicity and superior interface design of its predecessor. The program is a paradigm for WYSIWYG (what you see is what you get) word processing. There's no need for preview modes, and there are no separate windows for headers, footers, and footnotes. In fact, when you close all of MacWrite Pro's new palettes, the program looks and performs much like MacWrite II. MacWrite Pro's manual and on-line help also stand out for their clarity and brevity.

Still, there's room for improvement. Some of the program's operations are clumsy — for example, the use of the Transparent selection for wrapping text around irregularly shaped objects is

unintuitive. In a similar vein, from the Table menu, you can set MacWrite Pro to adjust the row height in tables to fit cell content, but to do so, you must first go to the Frame menu and select Auto-resize Frame — again, a somewhat confusing implementation.

The Bottom Line

MacWrite Pro will appeal most to those looking for a word processor that can double as a page-layout program. If you're already a MacWrite II user, getting the \$69 upgrade — with its welcome support for frames, styles, and tables — is the obvious way to go.

However, winning new users to MacWrite Pro will be a struggle. For those who can forgo the program's styles and section commands, it makes more sense to buy MacWrite Pro's multitalented cousin ClarisWorks. The integrated program's word processor provides many of the same features MacWrite Pro does, including text wrap and the ability to create columns and tables (although ClarisWorks' tables lack the formatting flexibility of MacWrite Pro's).

Moreover, the ClarisWorks word-processing environment provides several significant features that MacWrite Pro lacks, including an outliner, linked text frames, and split windows. Another plus is ClarisWorks' drawing tools, which are completely integrated with the word-processing module and are far more extensive than MacWrite Pro's primitive graphics tools.

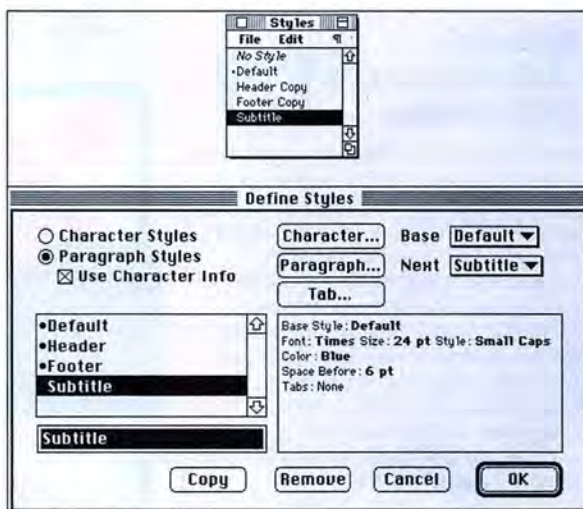
Last, for about the same price as MacWrite

Pro, ClarisWorks delivers not only a word processor but also a whole suite of applications, including a spreadsheet program, draw and paint tools, a communications program, and a database manager. The database manager, in particular, makes mail-merge operations easier with ClarisWorks than with MacWrite Pro. If you can make use of any of its other application modules, ClarisWorks is a much better buy.

For those seeking the high ground in word processing, we give the nod to Microsoft Word over MacWrite Pro, despite Word's steeper learning curve. Word simply outperforms MacWrite Pro in too many areas critical to advanced users — for example, Word provides an outliner, a glossary, an equation editor, and index and table-of-contents features. Furthermore, even though MacWrite Pro's table implementation is solid and easy to use, that of Word is more powerful. For example, MacWrite Pro's tables are restricted to 100 cells whereas Word has no such limitation. Worst of all, MacWrite Pro's speed tends to be glacial when you're working with large tables.

MacWrite Pro makes sense for those whose highest priority in a word processor is ease of use. For most people, however, MacWrite Pro delivers too little too late.

— Ted Landau



MacWrite Pro's Styles commands take a quantum leap beyond those of the program's predecessor. To quickly select a style, you use the Styles floating palette (top). The Define Styles dialog box (bottom) provides lots of flexibility for defining styles.

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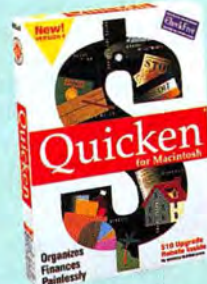
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UTILITIES

Tempo II Plus 3.0

Affinity's refurbished utility brings powerful macro-building features to System 7 users.

For System 7 users, CE Software's QuicKeys has been the only macro utility in town — until now, that is. The latest version of veteran macro utility Tempo not only has System 7 support but its powerful features also outdistance those of rival QuicKeys in several ways.

Reliable Performer

For starters, the new Tempo II Plus 3.0 release addresses the two main problems that plagued its predecessor. First, it supports System 7 and operates much more reliably than the previous version did under System 6. Second, a new well-designed editor lets you alter macros you've already recorded far more easily than the previous version did.

Tempo offers several levels of expertise. At its most basic, the program lets you simply record a series of actions — typing or making menu selections or dialog-box choices, for example — and then play them back. However, even at this basic level, you have access to Tempo's "smart" features. For example, Tempo doesn't simply record a mouse click on a button; it monitors how the

which provide programming-language power, are far more advanced than the extensions offered by rival QuicKeys. The utility provides nearly 50 built-in externals — including plenty of file-handling functions such as DeleteFile, CopyFile, and RenameFile — that you can use alone or incorporate into other macros. Many of the externals serve to retrieve information that you can then use in a macro or store as a variable for later use. The utility is also capable of interacting with Apple events and UserLand's Frontier scripts.

Although the externals are Tempo's most sophisticated component, the most sophisticated level of macro making is branching, or stringing macros together directly or based on conditionals. This feature is not available with QuicKeys. The real power of this function lies in conditional branching — "If the circumstances are such-and-such, do this; otherwise, do that." With externals that check such things as the Clipboard contents, whether a button is available or a menu item is checked, and how two retrieved variables compare, conditional branching provides sophisticated results with little effort.

Using key combinations is the best way to call up the macros you use most frequently. You can assign combinations you don't use often to Tempo's Macro menu, so you don't have to worry about remembering key combinations. You can either position the menu unobtrusively

in a corner of the menu bar or configure it to pop up when you click on the menu bar or anywhere else on-screen. You can also activate any macro by typing the first few characters of its name into Tempo's Play by Name dialog box.

Tempo is a powerful productivity tool, but the new release comes up a bit short in several areas. A macro can't use the current mouse position as the beginning of a click or drag operation. Given Tempo's otherwise sophisticated cursor positioning — relative to screen or window, for example — this seems an oversight. In addition, Tempo comes as an extension with a DA, some Fkeys, and a small application that goes into the Startup Items folder. Although you have to install everything only once, we'd like to see a more cohesive installation.

The new release also has a few minor glitches, most of which have workarounds. You can't, for example, put an AutoPaste macro directly into the Macro menu when you create it, as you can any other macro. AutoPaste, for some reason, requires an extra step — you must specify AutoPaste for the Macro menu after you've recorded the macro. Moreover, if you're moving the cursor along the menu bar to view menu contents, the Tempo menu doesn't automatically drop down — you must click on it to wake it up. Tempo also has trouble recording macros from Open dialog boxes that use pop-up menus for file filters and has problems recording selections from submenus when hierarchical-Apple-menu utilities are installed.

The Bottom Line

A few rough edges aside, Tempo II Plus 3.0 is a terrific tool that can satisfy the demands of the most fervent macro aficionados. And for those who don't require the full power of its externals and conditional branching, Affinity is putting the finishing touches on the simpler-to-use \$79.95 TempoEZ, due for release around the time you read this.

— Sharon Zardetto Aker



Tempo II Plus 3.0

Published by: Affinity
Microsystems Ltd., 1900 Folsom
Street, Suite 205, Boulder, CO
80302; 303-442-4840.
List Price: \$179.95.



Macro mavens who use System 7 will welcome Tempo II Plus 3.0, which features newly added System 7 support and a greatly improved macro editor.

click alters the button state — such as whether you've turned it on or off.

Tempo's enhanced macros, called externals, let you work on a more sophisticated level. Tempo's externals,

IMAGE EDITING

DeBabelizer

DeBabelizer simultaneously churns out file conversions and image-processing operations.

Applications that convert bit-mapped graphics from one file format to another are old hat. But a program that can convert a multitude of files all at once — rather than one at a time — is hot news. With a wealth of sophisticated batch-processing and scripting tools, Equilibrium Technologies' Eddy Award-winning DeBabelizer is a godsend to graphics professionals who regularly work with many image-file formats across multiple computing platforms.

Multilingual Utility

DeBabelizer's forte is file-format conversion and image processing. The utility handles an astounding variety of formats (about 50) created by as many as seven computing platforms, including the Mac; PCs running under DOS and Windows; and machines from Sun, Commodore, and Silicon Graphics.

The program runs in two modes: Simple mode provides file-conversion capabilities only; advanced mode gives access to DeBabelizer's powerful batch-processing and scripting environment.

With DeBabelizer's batch-processing features, you can convert dozens of files at once. You can set batch operations to occur unattended, so you can put DeBabelizer to work overnight. And DeBabelizer is smart — if one file in a batch list causes problems, the program doesn't come to a screeching halt. Instead, it notes the errant file in a log and forges on to process the remaining files.

DeBabelizer comes with a few basic image-editing tools (selection tools, eraser, pencil, brush, paint bucket), but its real strength — in addition to file conversion — lies in image processing. By creating scripts and adding them to batch operations, you can prompt DeBabelizer to process images as their file formats are being converted. In an editing window, you create and name scripts in one of two ways: by selecting commands from menus or by recording your actions with the Watch Me option.

The utility's processing commands let



DeBabelizer 1.4.02

Published by: Equilibrium Technologies, 475 Gate 5 Road, Suite 225, Sausalito, CA 94965; 415-332-4343.

List Price: \$299.

you manipulate images in a staggering variety of ways. For example, you can optimize color palettes, modify contrast and brightness, and scale and rotate images.

There's more. You can also remove backgrounds; work with separate channels of an RGB image; and compare one image with another to determine how they differ in color, depth, and size. Still more commands let you create thumbnail-image catalogs and generate slide shows. And with DeBabelizer's support for Photoshop plug-in filters, you can even apply special effects to images.

DeBabelizer not only speeds graphics work with its support for batch processing and scripts but it also boasts smart dialog boxes that remember your most recent settings. Even better, once you've specified your settings, you can have DeBabelizer skip the display of certain dialog boxes altogether.

Novices, Beware

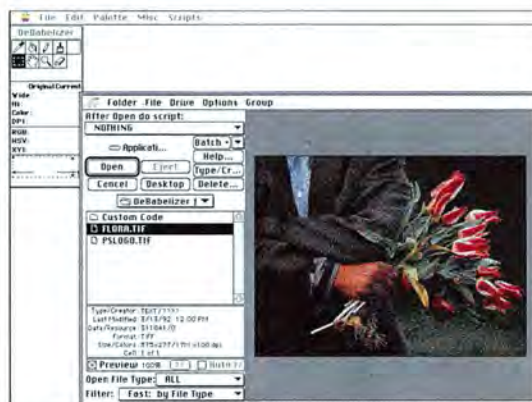
DeBabelizer's graphics-file magic aside, the program suffers from a poorly designed interface. Dialog boxes are cluttered and unintuitive. The program makes excessive use of hierarchical menus, which are poorly and sometimes illogically organized. The Miscellaneous menu, for example, is a hodgepodge of unrelated commands.

The manual isn't much help either. It's essentially a reference that documents commands, menu by menu. It

doesn't provide any overview of how all the parts of the utility work together. And given the program's complexity, it provides far too few examples of how to use DeBabelizer's tools.

The package also includes a companion booklet, optimistically entitled *Real World DeBabelizing*, that's simply a collection of testimonials. The booklet does little to help users learn how to use the program in a practical way.

As a result, we can recommend DeBabelizer only to savvy graphics professionals who require its industrial-level strength for production environments.



DeBabelizer belongs in every graphics professional's toolbox. However, its poorly designed interface can be confusing.

DeBabelizer requires System 6.0.7 or later and 700K of RAM. It's System 7-compatible but not -savvy.

The Bottom Line

Although DeBabelizer's poorly designed interface and weak documentation detract from its appeal, the program's talents for dealing with graphics file formats from different computing platforms make it unique. With unparalleled power at automating file conversion, combined with robust image-processing features, DeBabelizer is a must-have for any graphics-production environment.

—Gregory Wasson

PERSONAL INFO MANAGERS

DayMaker 2.0

Make your day with Pastel Development's
newly enhanced PIM.

Pastel Development took the first version of its multifeatured DayMaker calendar software back to the drawing board and returned with a solid upgrade that features more than 25 enhancements. Two of the most welcome are support for recurring events and the addition of a To-Do view.

Recurring Events

DayMaker's new support for recurring events provides a slew of scheduling options. For example, you can schedule an event to occur every other day, every weekday, every *n*th day, or every numerical occurrence of a day (every second Tuesday, for example); you can also schedule bimonthly and quarterly events.

DayMaker also lets you set the first and last occurrence for a recurring event and edit and remove individual recurring items. The program supports as many as six time intervals for a single event. So, for example, you can schedule an event for the first and third Wednesdays of every month and for the 31st of May.

Version 2.0 provides a better way to manage to-do items than the first version did, by displaying them in a separate List view. You can opt to forward "undone" items daily, weekly, or monthly as well



DayMaker 2.0.3

Published by: Pastel Development, 113 Spring Street, New York, NY 10012; 212-941-7500.
List Price: \$129.95.

as prioritize them. When DayMaker forwards an item, it maintains the original entry, so you always know exactly how far behind you are.

The new DayMaker also presents users with a cleaner and more straightforward interface than that of the original version. The awkward Item view, for example, has been replaced with a more intuitive Item window. However, if simplicity and an easy learning curve are your primary requirements for a PIM, we suggest that you look elsewhere. DayMaker packs a lot of functionality into a small package, but its interface lacks the simplicity of rivals Now Up-to-Date and DateBook.

DayMaker has five customizable views: Day, Week, Month, To-Do, and List. The ability to customize the program by grouping events and to-do items and displaying them in different views has always been a DayMaker strength. Version 2.0 builds on this advantage by letting you create subsets of your information for viewing and for creating reports. For example, you can design a custom Week view that displays only your scheduled phone calls. You can add any view you create to the DayMaker Views menu and arrange menu items in any order.

You can also create custom event types and sorts and add them to menus, but you can't modify them. To alter a custom event type or sort, you must delete the original and create a new one — an inconvenience. DayMaker is also limited to displaying one view at a time — we miss the ability to view a calendar and a to-do list side by side.

You can create hierarchical categories (*tags* in DayMaker-speak) for your events. Each category can have an unlimited number of subcategories, and you can further divide the subcategories. For example, you can divide the events in your Business category into Phone Calls, Presentations, Meetings, Addresses, and so on.

You can apply as many as six tags to a single event. Using the tags, you can then create highly specialized views and reports. This is a powerful feature for organizing your schedule, but it has one disadvantage. If you're not careful, you can easily pigeonhole events so that you get confused about which tags apply to which events.

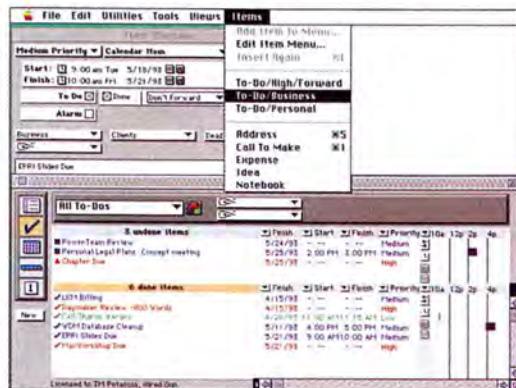
Oddly, unlike its predecessor, version 2.0, doesn't provide any custom printing options. Instead, DayMaker 2.0 incorporates Portfolio System's DynoPage Lite, which scales any DayMaker view to fit the pages of a variety of schedule organizers, including DayRunner, Day-Timer, and Filofax. DynoPage Lite also lets you print two-sided booklets and three-fold directories. Still, we miss the custom-formatting controls for printed output that the original DayMaker provided.

As a single-user product, DayMaker 2.0 can't compete with the workgroup-scheduling features of Now Software's Now Up-to-Date. However, Pastel Development is at work on several optional extensions — two of which may be available by the time this review appears — that will expand the calendar program's versatility. The first of these is an extension that will allow workgroup scheduling over a network. Another will provide address-book features.

The Bottom Line

DayMaker 2.0 is a solid upgrade to a flexible and versatile calendar program. The new release fills many of the gaps of the original version. If you need to micromanage your schedule, this full-featured single-user PIM may be for you.

— Tom Petaccia



DayMaker 2.0 features a new To-Do view. By dragging items to the bottom of the window, you mark them as completed.

Kodak PhotoEdge

Novices gain an edge on Photo CD image processing with Kodak's new graphics tool.

Kodak's Photo CD system — which lets you store your snapshots as high-resolution 24-bit images on compact disc — puts digital imaging within everyone's reach. But once you've shown Uncle Fud your digital pictures of the world's largest frying pan and the Trees of Mystery, what's next?

What's next is Kodak PhotoEdge, an entry-level image-processing application that lets you display, alter, and print Photo CD images as well as images stored in TIFF, PICT, or RAW format. You can also use PhotoEdge to incorporate Photo CD images into other applications and documents by saving the images in TIFF, PICT, RAW, or EPS formats.

Just the Basics

Although marred by a few eccentricities, PhotoEdge provides digital-image dabblers with easy access to several basic 24-bit-graphics tools. It requires color QuickDraw, 30 megabytes of disk space, System 6.0.7 or later, and no less than 4 megabytes of RAM. You'll also want a Photo CD-compatible CD-ROM drive to work with images stored on Photo CD discs.

To select images from a Photo CD disc, you can opt for either a preview of each photo in a dialog box or a contact sheet with thumbnails of every image on the disc. You can load multiple images, subject to RAM limits, but the inability to cut and paste between images makes this merely a convenience feature.

According to Kodak, PhotoEdge primarily addresses the two most common photographic faults — exposure and focus. To correct exposure, you use scroll boxes to tweak brightness and contrast and to fine-tune RGB color balance. The Preview button lets you view the results before you permanently alter a photo. If you dislike the change, Undo restores the earlier state of the image. For performing multiple image changes, however, we wish for one or two more levels of Undo.

To alter focus, PhotoEdge provides



Kodak PhotoEdge

Published by: Eastman Kodak Co.,
CD Imaging Division, Mail Stop
00811, 343 State Street, Rochester,
NY 14650; 716-724-4000.
List Price: \$139.

the following filters: Smooth, Sharpen, Sharpen More, Find Edges (to generate an etching effect), and Invert (to create a negative). Consistent with the simplicity of the program, these filters change the entire image — you can't alter a portion of an image, nor can you adjust the intensity of the filter.

PhotoEdge provides tools for zooming in to and out of images, moving and rotating images, and retrieving such information as the brightness of individual pixels (oddly, though, you can't alter individual pixels). The most useful tool is the cropping arrow, which lets you draw a rectangle to select a portion of an image and to specify the crop dimensions. You can't crop irregularly shaped areas.

When exporting images to other applications, you can convert them from 24-bit color to 4- and 8-bit color or gray scale or to monochrome formats that use one of several halftone patterns. PhotoEdge displays the converted version of an image in a separate window, but you can't filter conversions without saving and reloading them. Similarly, an apparent bug made it impossible for us to adjust the brightness or contrast on color conversions without saving and reloading them, although the brightness and contrast functions worked fine on converted gray-scale images. Also, images converted to 256-color TIFF format reloaded inaccurately as

images in 256-gray formats.

The output quality of images sent directly to a laser printer was acceptable although not outstanding; the quality of monochrome-converted images was a bit disappointing, in fact. However, the output quality of images saved as EPS files, placed into PageMaker documents, and printed with a PostScript laser printer was excellent.

The Bottom Line

With its basic image-processing and file-conversion abilities, Kodak PhotoEdge is aimed at inexperienced users looking for an affordable graphics tool designed for the Kodak Photo CD system. However, converting to Photo CD



Kodak PhotoEdge provides entry-level image-processing tools for Photo CD images. Unfortunately, you can't control the intensity of its filters, which sometimes produce undesirable effects, such as in the sharpened image shown here.

isn't a casual decision. In addition to the hardware and software costs, image transfer to disc (now widely available at photo stores) runs as high as \$1.79 per image. For those who have made that choice, though, PhotoEdge's tools are simple and intuitive enough to be instantly useful. Although a few bugs need fixing and data doesn't always export as expected, PhotoEdge provides a good introduction to digital-image manipulation.

— Bob Lindstrom

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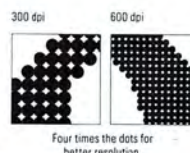
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NUMERICAL ANALYSIS

Data Desk 4

Data Desk is an able navigator for statistical-data exploration.

The latest release of Data Desk builds on the program's solid reputation as the leading statistics software for exploratory data analysis. The program teams ease of use with advanced features, making it a good choice for novices as well as experienced statisticians.

Visualizing Data

Previously published by the now defunct Odesta, Data Desk 4 has returned to its original developer, Data Description, Inc. As in the previous versions, Data Desk 4's primary focus is exploratory data analysis (EDA). EDA helps you see the complex patterns and relationships in data — before you begin hypotheses testing — using interrelated graphs and tables.

Data Desk differentiates itself from competing statistics programs with its ability to link data and plots interactively across multiple windows. When you assign a color to an outlying point in a scatterplot, for example, Data Desk applies the same color to that point when it appears in related plots. This lets you easily view your data in a variety of graphical contexts. Similarly, when you select a group of points in one plot, Data Desk highlights the same group in related plots.

You can also quickly manipulate your data by interacting directly with graphical displays — for example, you can graphically adjust the scaling of a plot and select a subset of points and earmark them for a separate analysis, without going through intervening dialog boxes or the typing of commands.

Commanding Menus

Newcomers to Data Desk 4 will find the program surprisingly easy to use. You can perform most plots and calculations with a single command.



Data Desk 4

Published by: Data Description, Inc., P.O. Box 4555, Ithaca, NY 14852; 607-257-1000.

List Price: \$595.

For example, to add a new variable to a Linear Model analysis, you simply drag the icon representing the variable to the Linear Model window. The analysis is immediately updated, without the need to redo existing work.

After the program has completed a plot or calculation, HyperView pop-up menus help you decide what to do next. Located within each results window, these menus let you choose from context-sensitive lists of related analyses and modifications. When you select an item, Data Desk performs the requested action automatically.

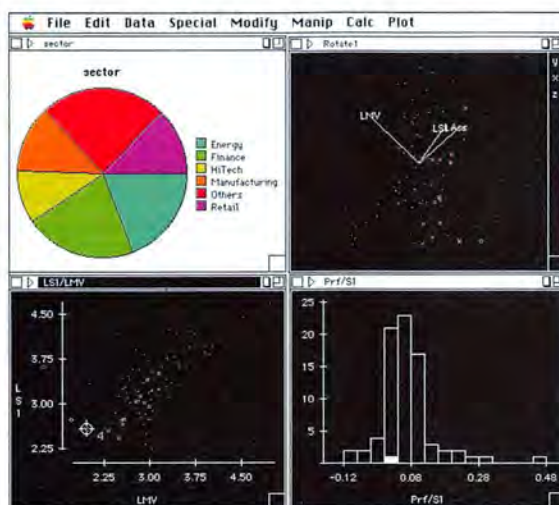
Data Desk uses an unusual method for data entry and display. Instead of having the row-and-column spreadsheetlike

format common to other statistics programs, Data Desk stores each variable (company, assets, or sales, for example) in a separate window. Each window acts in much the same way that a column does in a spreadsheet. You open the windows by double-clicking on icons assigned to the variables. Fortunately, windows are linked, so when you scroll through one window, the program automatically scrolls through the others, effectively mimicking the process of scrolling through a spreadsheet.

This approach takes some getting used to, but it does offer several advantages over the traditional spreadsheet format. For example, you can create derived variables and sort scores without affecting the original data set. And you don't have to create a new file to store modified data. Instead, Data Desk stores a modified data set as a separate variable with its own icon. Each analysis you carry out is similarly stored as a separate icon in the Results folder. By double-clicking on a Results icon, you can view the analysis.

Although Data Desk's plots succeed admirably in helping you decipher patterns in data, they're not well suited to presentations. The Data Desk Layout window lets you easily arrange analyses on a printed page, but the plots themselves are rather sparse and include only a few enhancement options. There's no support for legends, for example. In addition, several common plot types, such as group means (useful for interpreting interaction effects), are difficult, if not impossible, to create.

Data Desk's documentation continues to stand out as a beacon of clarity among statistics programs. The package comes with two main manuals — one explains the workings of the program, and the other details



Data Desk 4 is the premier statistics tool for exploratory data analysis. All the plots shown here are linked — when you select a point in one plot, the program highlights the same point as it appears in related plots. This means that you can view the same data in a variety of formats.



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NEW ON THE MENU

REVIEWS

statistical procedures. The latter is so thorough and well written that it could almost serve as a text for a course in statistics. For those who shun manuals, Data Desk's excellent on-line help navigates users through most of the program's complexities.

Users familiar with the previous version of Data Desk may not immediately notice the many additions and enhancements present in version 4. The changes tend to be more evolutionary than revolutionary. Noteworthy are a much enhanced General Linear Model tool, new nonlinear smoothing functions, and an option for summarizing data by category.

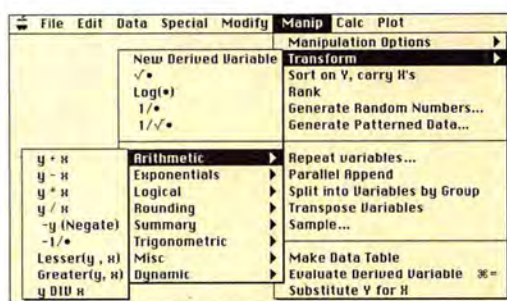
Still more enhancements are planned for the upcoming Data Desk 4.1 upgrade, which should be available by the time you read this. The upgrade will be offered free to current users of Data Desk 4. We looked at a prerelease of the upgrade and noted more than 20 additions. By far the most significant is the new Hot-Sets feature, which makes it easier to compare the results of analyzing subsets of data. This capability is important when you're trying to decipher whether the patterns in a plot or analysis are consistent throughout a data set or vary from group to group.

The upgrade also features several enhancements to Data Desk's Layout windows. Users will be able to link plots to their corresponding representations, called pictures, in the Layout windows, so changes to plots will result in automatic updates to pictures in the Layout windows. Data Desk 4.1 also includes popular nonparametric tests, such as the Mann-Whitney U and the Wilcoxon.

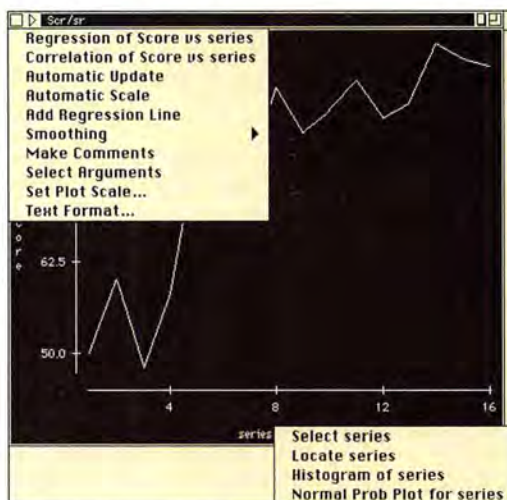
The Bottom Line

Data Desk 4 is Mac software at its best. The program is easy to learn and powerful, providing a broad range of statistical capabilities and sophisticated EDA tools.

Data Desk's closest rival for EDA is



Data Desk 4's extensive menu selections let you manipulate your data with a single command.



Data Desk 4's pop-up menus help users decide what to do next.

JMP, from SAS Institute. Although you can't go wrong with either program, we found Data Desk more convenient to operate. In particular, navigating JMP's menus and windows seems unnecessarily complicated when compared with using Data Desk's graphical-manipulation tools and single-command data management.

Of course, not every statistician requires EDA tools. For those who don't, Data Desk is also a quite capable hypothesis-testing tool. From t-tests and correlations to multiple regression and ANOVA, Data Desk's capabilities cover the gamut. However, if you need traditional hypothesis-testing tools as well as high-quality presentation graphics, you might want to consider StatView, from Abacus Concepts, but keep in mind that StatView's range of advanced statistical functions is limited—the program lacks the Linear Model and multivariate analyses Data Desk includes.

— Ted Landau

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IMAGE EDITING

Aldus Gallery Effects and Kai's Power Tools

Two new plug-in collections boost Adobe Photoshop's special-effects capabilities.

Avid Adobe Photoshop users can enhance their application's special effects with two new Photoshop plug-in collections. Both Aldus Gallery Effects: Classic Art, Volume 2, and Kai's Power Tools, from HSC Software, add a wealth of new image-manipulation filters and tools to Photoshop as well as to several other supporting applications. The Gallery Effects collection adds to Photoshop's suite of standard filters, and Power Tools opens new creative vistas in special effects.

When you copy the Gallery Effects (GE2) and Power Tools (KPT) files into your Photoshop-plug-in folder, the plug-ins appear, ready to use, in Photoshop menus. Because they're integrated with Photoshop (or another supporting application), the learning curve is simplified. Images you've transformed with the plug-in filters are immediately available for further manipulation in the host program. You can apply GE2's and KPT's tools to an entire image or to selected areas.

Aldus Gallery Effects: Classic Art, Volume 2

GE2's 16 effects can be applied to scanned photographs and other bit-mapped images to create painting and drawing styles. Effects range from colored pencils to rubber stamps. Most work without a hitch, although the results depend largely on the original image. The Stamp effect, for example, looks muddy when applied to images that contain many tiny details.

GE2's well-designed interface makes it ultraconvenient to achieve desired results. It provides Before and After views, so you can see how different settings will affect the image before you start the transformation process. The modifiable settings are well marked, and most present you with standard click-and-drag sliders with accompanying numerical displays. The Glowing Edges effect, for



**Aldus Gallery Effects:
Classic Art, Volume 2**
Published by: Aldus Corp.,
Consumer Division, 5120
Shoreham Place, San Diego, CA
92122; 619-558-6000.
List Price: \$99.



Kai's Power Tools 1.0d
Published by: HSC Software,
1661 Lincoln Blvd., Suite 101,
Santa Monica, CA 90404;
310-392-8441.
List Price: \$149; \$39 extra
for expert features.

example, lets you adjust the edge width and brightness and smoothness levels with individual sliders. You can save your favorite settings. Another useful feature is the well-written on-line-help facility, which offers not only clear explanations of how individual settings work but also creative suggestions.

Filters include Accented Edges, Angled Strokes, Diffuse Glow, Grain, Note Paper, Palette Knife, Patchwork, Photocopy, Rough Pastel, Sprayed Strokes, and Underpainting.

GE2 filters come in three versions — in addition to those that work with Adobe

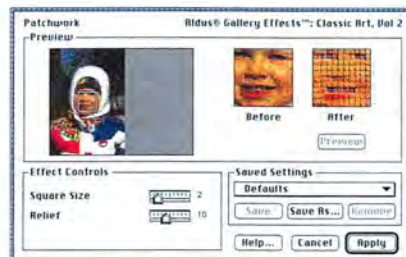
Photoshop, there's a version for Aldus SuperPaint 3.0 and another for Aldus Digital Darkroom. According to Aldus, the Photoshop version also works with other Photoshop plug-in-compatible applications, such as Fractal Design's Painter and ColorStudio 1.5, Adobe Premiere, SuperMac Technology's Pixel-Paint Professional 2.0, and Strata's StrataVision 3d 2.5.

Kai's Power Tools

The *Kai* in Kai's Power Tools is Kai Krause, author of *MacUser's* Photoshop Tips and Tricks section. In addition to a variety of traditional filters, the 33-filter collection provides more-ambitious offerings that significantly extend Photoshop's power.

KPT's Gradient Designer lets you create complex gradients that would otherwise be difficult, or impossible, to do in Photoshop. Gradients can contain as many as 512 color combinations. Even more impressive, you can select Transparent as you'd select any other color, so you can easily create blends of varying opacity. Gradient styles include the familiar linear and sunburst (*radial* in Photoshop vernacular) and the new radial sweep and square burst. If you fork over another \$39, the company will provide you with a code for unlocking additional "expert" features.

You can create your own gradients as well as alter any of the generous number



Aldus Gallery Effects: Classic Art, Volume 2, a collection of Adobe Photoshop plug-ins, uses a conventional interface to present standard image-enhancement features to users.



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VIEW ON THE MENU

REVIEWS

supplied with KPT. Gradients are conveniently grouped in a hierarchical menu. You begin to get an idea of the weird and wonderful image transformations you can create with KPT simply by reading the filter names, which include Pixelstorm, Diagonal Agony, and Purploid Sphere. Filter categories include Special Effects, Framing Effects, and Metallic. Like most of the other tools in the collection, Gradient Designer offers a decidedly non-standard dialog box.

You can use the gradients you create and save in Gradient Designer with other KPT modules, including the powerful Gradient on Paths plug-in, which lets you wrap a gradient around any path created with the lasso or marquee tool. This feature offers a rich assortment of customizing options and handy preview windows. It also lets you save custom settings.

KPT's unique Texture Explorer also merits a mention. This plug-in lets you generate a seemingly limitless set of textures for use as backgrounds or other image elements. With Texture Explorer, you gain access to nearly 200 ready-made textures, including marbles, woods, snakeskin, fire, and paisley. You can also easily create custom textures.

All KPT textures are generated mathematically, which eliminates the need for disk-hogging scans. Customizing controls are visually oriented — you select a texture you like and tell KPT to mutate it. You get 12 variations of the texture, and you can continue to mutate these until you find what you like.

A third major component of KPT is its collection of fractal creators and explorers. You don't need to know the theory behind fractals to appreciate the amazing designs they generate by using blends from Gradient Designer.

KPT's more basic tools include filters for smudging and sharpening and for creating glass-lens bubbles and artistic noise. Although some of these filters sound similar in name to proprietary Photoshop effects, KPT generally offers greater control and/or more features. KPT was designed to work with Photoshop, but according to HSC Software, you can also use it in conjunction with Fractal Design's Painter 2.01.

Overall, the KPT collection presents a decidedly unconventional interface, although users are well rewarded for their learning efforts. KPT can operate with 8-bit video, but you'll see a marked



Kai's Power Tools is as trippy a collection of Adobe Photoshop plug-ins as you'll find anywhere. The collection's interface (top) is as far out as its effects. Shown here are a Gradient Designer effect (middle) and a Julia fractal effect (bottom).

improvement if you move to 24-bit. You'll also need 4.5 megabytes of hard-disk space.

The Bottom Line

Because there's little overlap between the capabilities of Aldus Gallery Effects: Classic Art, Volume 2, and those of Kai's Power Tools, it's not an either/or choice between the two Photoshop plug-in collections. They offer enough mutually exclusive image-manipulation features to justify purchasing both. You'll get more bang for the buck with KPT, but GE2 offers good value as well.

— Shelley Cryan



OR



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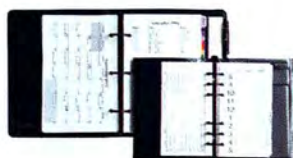
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UTILITIES

FileRunner, Shuttle Pilot, and Synchronize!

FileRunner bests the competition with file-syncing savvy and ease of use.

Managing files that exist on both a PowerBook and a desktop Mac has always been a dicey proposition. But three new utilities aim to help users synchronize files between portable and desktop Macs. FileRunner, Shuttle Pilot, and Synchronize! all have similar goals, but FileRunner is the only one likely to score with PowerBook users.

FileRunner

With its well-thought-out interface, built-in virus checking, excellent manual, explanatory dialog boxes, and built-in compression, FileRunner is easily our top choice among the three file-syncing utilities we tested. It's also the first such utility designed to support file syncing that involves more than two machines (network managers are well advised to take a look at FileRunner for software updates across networks) and the only utility that supports the use of a floppy disk as the transfer medium between two machines.

To begin file syncing with FileRunner, you select a Source volume and a Runner volume. The Runner can be a destination volume or, alternatively, a floppy disk that's being moved between machines. You can choose between one- or two-way syncing and set options to include or exclude nested folders, specific files, items with names that match certain criteria, and files of a specific type. You can also set FileRunner to notify you when there's a new file on either volume and when a file's been deleted from a volume since the last time you ran the utility.

FileRunner has several unique properties. In addition to its support for syncing among multiple machines, it can compress files for floppy-disk transfer and backup. It also incorporates the Virex virus-protection program (including



FileRunner 1.0

Published by: MBS Technologies, 4017 Washington Road, #4000, McMurray, PA 15317; 412-941-9076.
List Price: \$99.95.



Shuttle Pilot 1.1

Published by: Xanatech, Inc., P.O. Box 40157, Albuquerque, NM 87196; 800-484-7227.
List Price: \$49.



Synchronize! 2.1.2

Published by: Qdea, 6331 Hilton Court, Pine Springs, MN 55115; 303-339-7013.
List Price: \$59.

updates to registered users for new viruses). But even if it didn't have these special talents, FileRunner would still be a top contender in the file-sync-utility

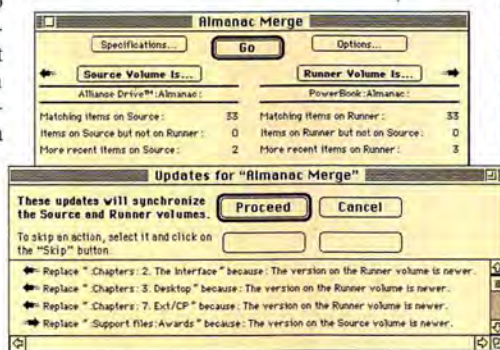
contest. Current contenders, in addition to those reviewed here, include Leader Technologies' PowerMerge and Inline Design's Inline Sync and the syncing modules in Symantec's Norton Essentials for PowerBook and Connectix's Connectix PowerBook Utilities (see "Traveling Companions: PowerBook Utilities," May '93, page 90).

Our only complaints about FileRunner are minor. Its main window has a Go button that's initially confusing — it seems to indicate that clicking on it would start the syncing process before you've had a chance to view proposed file changes. What it actually does is start the analysis of the Source and Runner volumes. In addition, the ability to include or exclude items based only on simple "name contains" criteria makes us wish for more options, such as "starts with a number" or file-type criteria.

Shuttle Pilot

We found Shuttle Pilot lacking in several key areas. Initially, it presents you with a simple setup window for managing the pairs of folders you want to synchronize. Once you've completed the setup, you select one of the pairs and Shuttle Pilot lists the files that need to be updated in either direction. Arrows indicate which way the files will move. The default direction copies the most recently changed files over older files. A white arrow in place of a black one signifies that both files being synchronized have been changed.

The setup process is smooth, but many problems limit Shuttle Pilot's usefulness. When you're setting up your paired folders, for example, you can't include nested folders — these must be set up separately. After setup for file syncing has been completed, Shuttle Pilot displays only those files that are moving one way or the other — it doesn't



FileRunner's file-synchronization interface is well designed — it keeps you fully informed about which files it's copying and why.

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let you view subfolders, files the main folders have in common but that don't require syncing, or older versions of files that exist in both folders.

Small but annoying interface glitches further complicate the syncing process. When you close Shuttle Pilot's window, the program quits. When you select File Info for information on file size and modification date, the utility sends you to the standard Get Info window on the desktop. Using the Open command closes the current sync document without saving its changes. Most disturbing were the repeated crashes and freezes, even on a system without extensions.

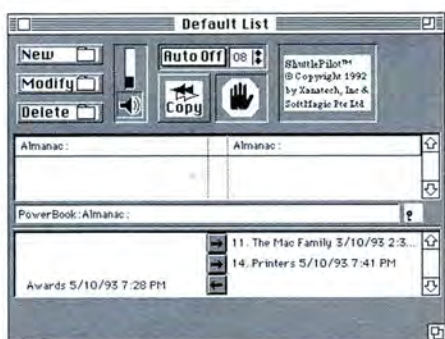
Synchronize!

Synchronize! is so bare-bones that it doesn't even inform you when linked files have been changed on both volumes since the last time you synchronized them. The documentation brushes this feature aside by stating, "Naturally, you wouldn't make changes to the same document in two different places." We beg to differ.

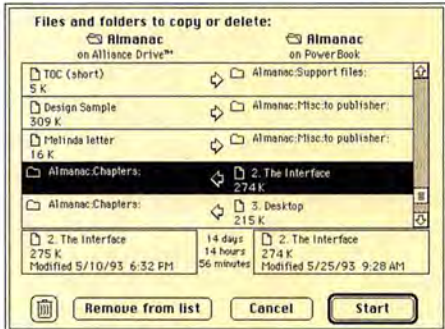
Synchronize! lets you specify which folders you want to match between volumes. But the dialog box that previews items to be copied back and forth between volumes is a bit too simplified. As a file is being copied, Synchronize! doesn't tell you which source folder it's in, although you can view the destination folder. And Get Info identifies a file's modification date but not its path.

In general, Synchronize!'s interface is unintuitive — one dialog box even gives you the option of "ejecting" your hard disk after synchronization has occurred. But there are several bright spots: dialog boxes let you set Copy or Don't Copy criteria that include partial or full filenames, modification dates, file types, and even labels from the Finder's Label menu. Unfortunately, there's no way to include or exclude nested folders — all nested folders are included by default and must be manually removed from the list every time you run the sync.

Worse, because Synchronize! doesn't keep track of the last time you synchronized files, it can't tell you if two related files have changed since the last sync. It also can't tell the difference between a



Shuttle Pilot's window tells you which files it's copying, but there's nothing to indicate that newer files are replacing older versions.



With Synchronize!, you must select a file from the file-sync list to see that the utility is copying one file over another.

new file on one system that has no counterpart on another and a file whose counterpart has been deleted. So if a folder on your desktop Mac contains a file that doesn't exist in the folder's counterpart on your PowerBook, it's up to you to decipher whether you either created the file on your desktop Mac or deleted it from your PowerBook since the last sync. Synchronize! knows only that the file is on one volume and not on the other.

The Bottom Line

As PowerBooks continue to fly off dealers' shelves, file-synchronization utilities will become an ever more popular means of managing files between PowerBooks and desktop Macs.

Of the three utilities reviewed here, we highly recommend FileRunner. It offers one of the best-designed file-sync interfaces we've seen. Shuttle Pilot, on the other hand, presents users with so many hurdles that we can't recommend it. And Synchronize!, with its overemphasis on simplicity, leaves out many key features.

— Sharon Zardetto Aker

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PAGE LAYOUT

Renaissance

A half-baked feature set mars Kodak's flexible single-page-design tool.

You've probably noticed that Kodak isn't just selling film anymore. Its forays into the computer-imaging world have resulted in a growing line of software titles for the Mac. One of the latest is Kodak Renaissance, a \$695 single-page-design and -layout program that combines desktop publishing, drawing, and image-editing features. Renaissance also brings to the table several special talents that no other Mac program provides. However, in this first iteration, we found the program's feature set surprisingly incomplete, and its quirky interface may give some users a rough ride.

Electronic Compiling

What sets Renaissance apart from other page-layout programs is its focus on creating comps, or mock-up page designs. To help designers do this electronically instead of by hand, Renaissance lets users manipulate page elements directly, without relying on menus or dialog boxes. For example, you can change line weight or text point size simply by dragging a special handle.

Other tricks include pop-up menus that peek out from the sides of tools when you click on them and a wealth of keyboard shortcuts. In addition to its handy menu-bypassing design, Renaissance boasts several other features that make mock-ups easy. For example, you can pour customizable dummy text into text boxes, gain quick access to libraries of canned objects, and attach annotations to any object (you can opt to hide notes at print time).

Renaissance is not designed to replace PageMaker, but it borrows the venerable page-layout program's most distinctive and popular feature: its pasteboard metaphor (in Renaissance lingo, it's called the drawing board). It serves as an off-the-page area for objects and text. Borrowing a popular feature from QuarkXPress, Renaissance provides two ways of working with page elements: interactively, by directly manipulating



Renaissance 1.1

Published by: Eastman Kodak Co., 343 State Street, Rochester, NY 14650; 716-724-4000.
List Price: \$695.

objects, or indirectly, by entering numerical values in dialog boxes.

In addition to a set of basic design tools, Renaissance provides several surprisingly sophisticated features. For example, there are a bewildering number of options for controlling how grouped objects react when resized.

Renaissance is no competition for large-document page-layout programs, but it could squeak by for single-page text-filled projects. The program provides full hyphenation and justification features, kerning and tracking, styles, and even automatic drop caps. You can also link its text boxes and flow text from one box to another.

Considering that Renaissance comes from the company that gave you Koda-chrome, it's no surprise to find that it sports a 256-color palette, full Pantone and CMYK support, and a slew of color-separation options. The package also bundles a Photo CD disc that contains 24 sample images.

Renaissance really shines in the flexibility it provides for dealing with display text (which it treats differently from text in boxes). You can work with each character in a block of display text separately, and the block retains the properties of editable text. For example, in the word *Splurge*, you can make the *p* green, turn the *S* upside down, and increase the point size of the *g*. And you can complete these operations interactively, without ever having to resort to a dialog box. In addition,

even after you've joined text to a path, you can still edit the text and move it anywhere on the path.

Missing Ingredients

For all of its special features, Renaissance is not without flaws. Kodak positions the program as a compelling tool that complements mainstays such as Photoshop, PageMaker, and FreeHand. However, you can't export editable mock-ups to these other programs (only EPS export is supported), so any implied synergy is lost.



Renaissance gives designers extraordinary control over display type by enabling them to manipulate it directly. Body-text control is largely from the Type menu.

In addition, Renaissance lacks a variety of important features. It has no easy way to make selections when masking graphics, no text-overflow indicators for text boxes, and no layer controls. Moreover, the program doesn't support type outlines or TrueType or Type 3 fonts. And there's no way to import formatted text, auto-number pages, or draw from the center of an object. A spelling checker is also missing.

The program's unorthodox interface is another problem. In its attempt to be innovative and interactive, Renaissance fails to conform to several important interface conventions. For example, you use its eyedropper tool not only to pick up color and fill with color but also to pick up and drop images and text — an unusual approach that can be confusing.

Additional interface glitches include an alignment tool that's downright unusable and a nonstandard implementation of the Shift key. Also, we were unable to save files until we had deselected all text.

The Renaissance documentation is poorly indexed, and the program provides no on-line help. Kodak's technical-support department also failed to respond to our calls.

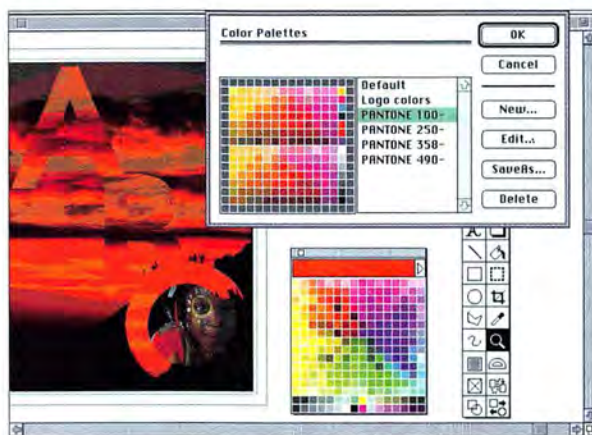
The Bottom Line

Renaissance is an interesting mix of design tools, but its inability to export editable files to PageMaker undermines its credibility as a compelling tool. On the

other hand, with its single-page-design focus and penchant for display-type tricks, it seems a logical but pricey tool for creating advertising and marketing material. However, given its unconventional interface and incomplete feature set, most designers will probably prefer Multi-Ad Creator, from Multi-Ad Services, for these tasks.

Overall, we found Renaissance impressive in some areas, especially in display-text manipulation. But we advise interested designers to wait for the next version, which hopefully will improve the interface and introduce a wider range of illustration features and export options.

— Dave Valiulis



Although Renaissance's unconventional interface is a drawback, the program's object libraries are a plus — they provide quick access to palettes, styles, and graphic objects.

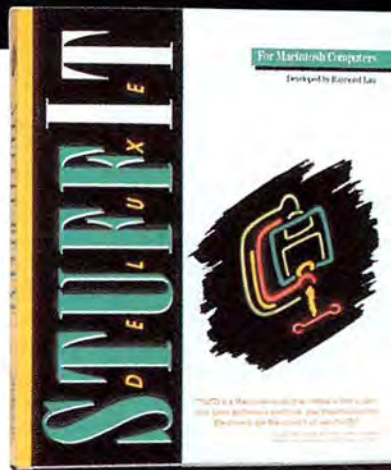
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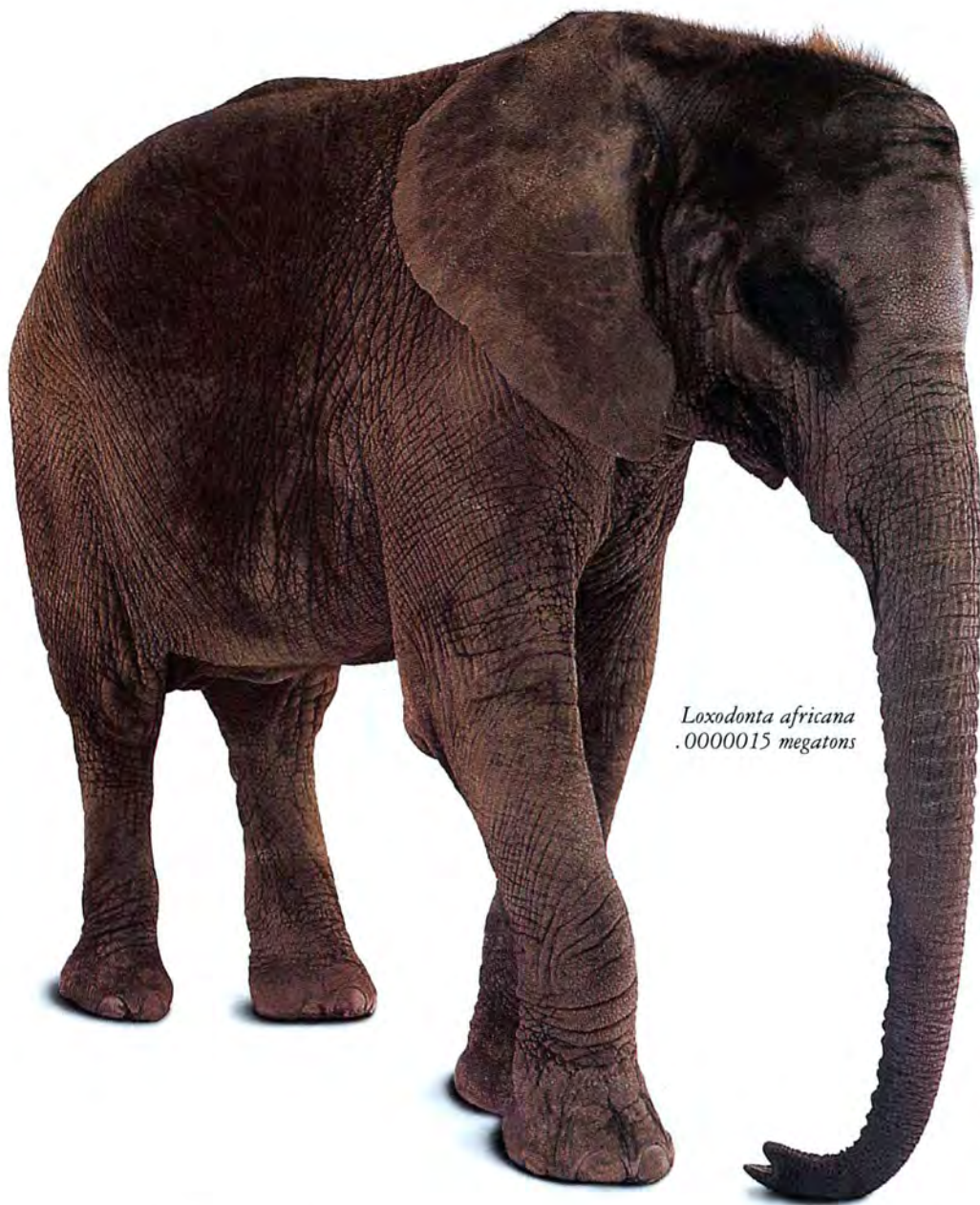
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CIRCLE 136 ON READER SERVICE CARD.

UTILITIES

Snooper 2.0

Maxa's diagnostician tells you when a good Mac's hardware has gone bad.

We've all been there. You fire up your Mac, and Murphy's Law takes over — your hard disk acts flaky, your spreadsheets take forever to recalculate, your keyboard works only intermittently. Before you panic and rush your machine to a dealer, try running Maxa's Snooper. Snooper is a hardware-diagnostic utility that can help you decide whether your Mac simply needs a little tender loving maintenance or whether its problems merit a visit to the repair shop.

The first version of Snooper had trouble paying for its keep — it failed to consistently pinpoint problems. The latest release, however, is a vast improvement. Snooper 2.0 features not only more troubleshooting tools than its predecessor but also a greatly enhanced interface. Moreover, our tests showed version 2.0 to be a competent diagnostician that correctly identified a variety of real-world problems, including such anomalies as bad RAM SIMMs and faulty SCSI controllers.

Put to the Test

Maxa has designed Snooper to perform three basic types of diagnostic tests. First, the utility can test the overall condition of the Mac's various hardware components. Second, it can run benchmark tests that measure hardware-component performance. You can use the results to compare your Mac's performance with that of a similar system tested in Apple's laboratory. Third, Snooper provides a Help menu that assists in troubleshooting Macintoshes that don't start properly. Snooper tests virtually all the 250 or so major electronic components that make up a typical Mac, including CPU, SCSI, RAM, video RAM, internal NuBus and PDS expansion slots, audio circuitry, connection ports, add-on accelerator or SCSI cards, keyboard and mouse connections, attached



Snooper 2.0

Published by: Maxa Corp., 116 N. Maryland Avenue, Suite 100, Glendale, CA 91206; 818-543-1300.
List Price: \$249; \$349 for NuBus kit.

printers and hard-disk drives, and video monitor.

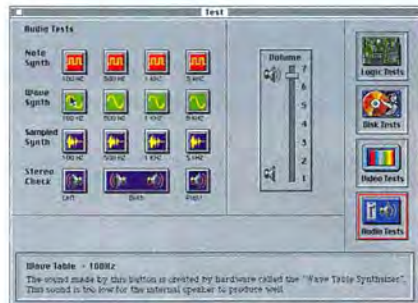
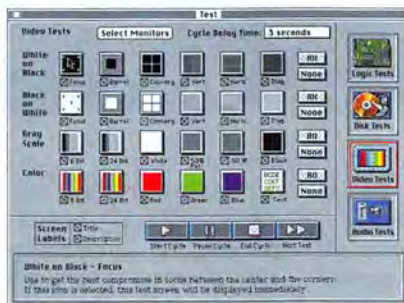
You don't have to be a hardware technician in order to use Snooper effectively. Snooper puts average users at ease with informative graphic displays. You jump among the program's four major testing areas — Logic, Disk, Video, and Audio — by clicking on icons. When you click on the Logic Tests icon, Snooper even displays a customized graphic of your Mac's logic board. When you move the cursor over the board's

various components, Snooper displays detailed information on each component and its function — an especially helpful feature for novices.

Each test area displays icons that initiate individual tests or a series of tests. In addition, the Reset Log icon lets you zero out of the current test and the View Log icon reveals the results of the tests. VCR-like controls are provided for Start Cycle, Pause Cycle, End Cycle, and Next Test. Pull-down menus also provide access to Snooper's testing facilities. The control screens and pull-down menus make Snooper a breeze to operate, even if you don't know your SCSI bus from your ADB port.

Custom Reports

Once Snooper has run a series of tests, it creates custom reports based on its findings, so you can easily compare the state of your Macintosh today with its



Snooper 2.0 performs more than 250 diagnostic tests on your Mac's hardware components, making it the most thorough and capable hardware-diagnostic utility you can buy. Its use of graphical displays makes it easy for novices to use.

condition a month ago. These reports also come in handy when Snooper finds a hardware problem that requires professional repair. When you take your machine to be fixed, you can save the technician time (and yourself money) by handing over the logs. Another advantage is that Snooper can flag small problems that can be easily corrected before they grow into major disasters. For example, in our tests, Snooper found loose cables before they caused logic or hard-disk failure.

Naturally, no diagnostic program is perfect, however, and Snooper's no exception. On a few occasions, we were able to trick the program into flagging nonexistent problems. For example, when we powered down an external hard drive in the middle of a test, Snooper signaled that the SCSI bus was in distress. Snooper also failed to detect one real problem — we connected an external hard drive with known defects in both its power supply and SCSI address switch to our Macintosh. Snooper missed these problems

altogether. In general, however, we discovered that Snooper lives up to its name admirably.

The Competition


Snooper's best-known rivals are the \$149 Peace of Mind utility, from Polybus Systems, and the \$99 MacEKG system extension, from MicroMAT Computer Systems. MacEKG runs only 35 diagnostic and performance tests, with an emphasis on an overall performance rating for the tested Mac. Peace of Mind conducts about 100 diagnostic and performance tests, compared with Snooper's 250, and its interface lacks Snooper's slick design, ease of use, multiple control facilities, and excellent status feedback. We also found that Peace of Mind wasn't as diligent as Snooper at detecting hardware malfunctions — it failed, for example, to flag the same loose SCSI-connection problems that Snooper rightly identified as a SCSI-test failure. For serious and complete Mac-hardware diagnostics, Snooper's hard to beat.

Two Flavors

Snooper is available in two flavors: a \$249 software package and a \$349 hardware/software bundle for Macintosh II-class NuBus machines. The software package includes a separate emergency startup disk for really sick Macintoshes that completely fail to boot from their hard disks. The hardware/software package, which we didn't evaluate for this review, includes a diagnostic board for detecting problems with the power supply, NuBus handshaking, and the ADB port.

The Bottom Line


Whether you're a hardware technician or a computer novice, we think you'll find Snooper to be a good tool for pinpointing hardware-related Macintosh problems. Although it is unable to fix hardware malfunctions, Snooper can help you avoid trouble by flagging small problems before they turn into major disasters.


— Don Crabb 

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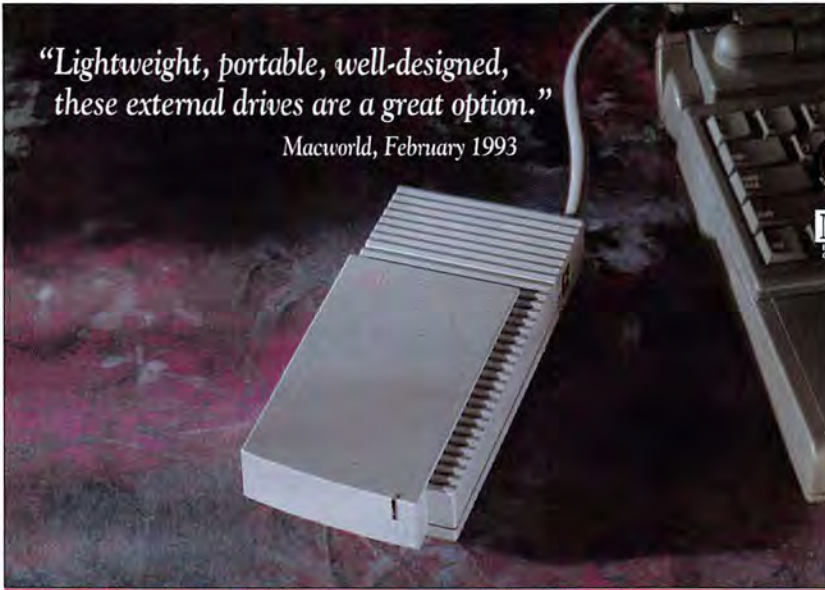
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Macworld, February 1993



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Theirs

- Internal termination does not meet SCSI specifications.
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- AC adapters not readily available.
- Generic design.
- Does not have Silverlining features and benefits.
- No awards.

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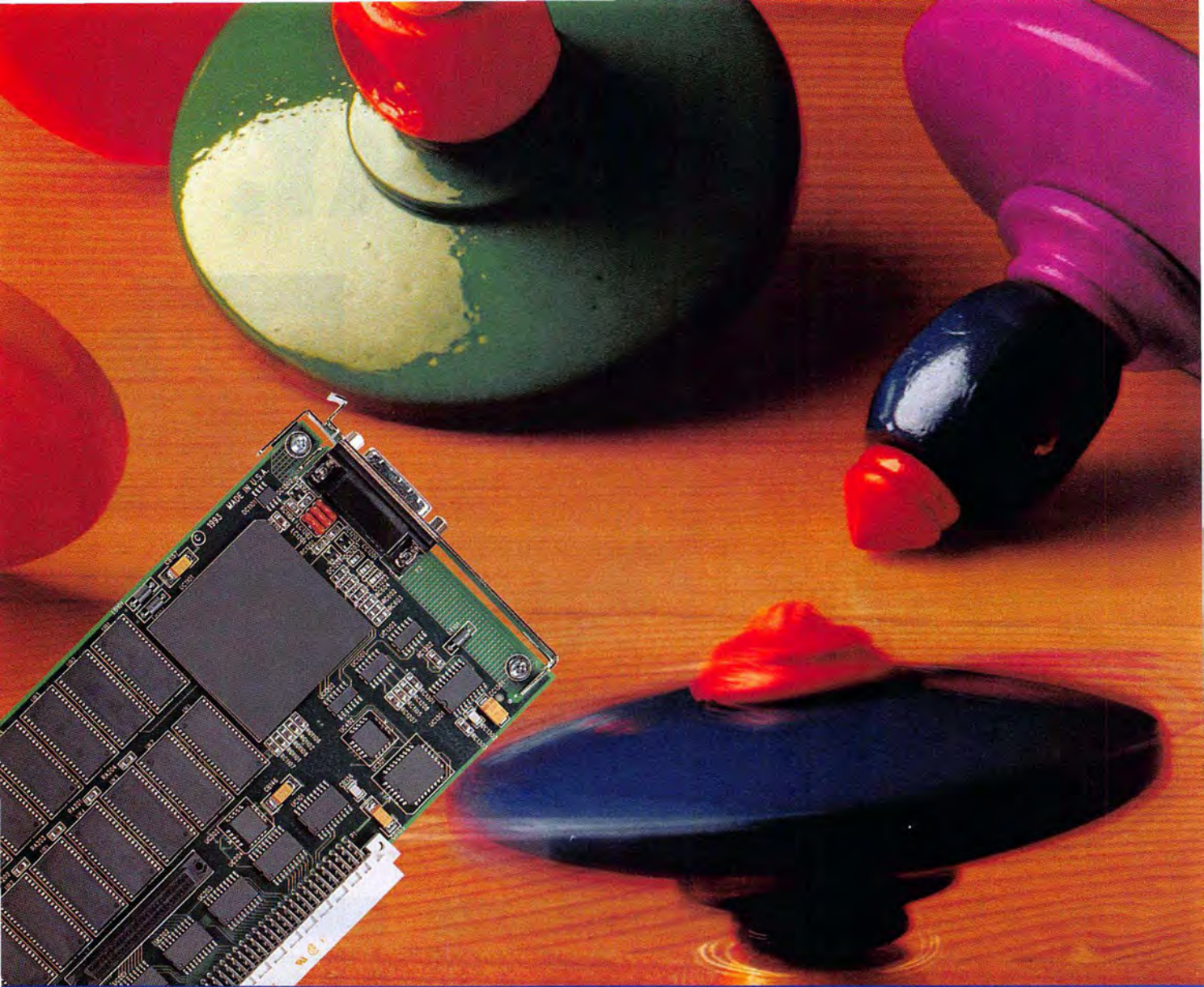
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QUICK CLICKS



A Hard Day's Night

↑↑↑↑↑

The Voyager Company's QuickTime CD-ROM version of the Beatles' first film, *A Hard Day's Night*, is an easy sell to Beatles fans. Who else would want to step scene by scene through a movie, stop the action at key points (is that a Coke or a Pepsi bottle John Lennon is sniffing?), and check out esoteric factoids such as the exact date George Harrison received the prototype Rickenbacker 12-string guitar that created the movie's famous opening chord?

But this CD-ROM is too well crafted to appeal only to fans, many though they may be. *A Hard Day's Night* is a logical extension of Voyager's Criterion series of films reissued on laserdisc with added critical commentary and extra footage. Here, though, this kitchen-sink concept reaches new extremes. On one CD-ROM, you get the entire film and much more: the theatrical trailer for the film's reissue, the script (both as written and as shot), still photos, director Richard Lester's short *The Running Jumping Standing Still Film* (which influenced *A Hard Day's Night*) in its entirety, plus a long film-criticism essay and copious annotations.

The interface for this collection of treasures is gorgeous, done completely in gray scale (as is the film itself). And the movie is quite watchable, even at the usual QuickTime size of about 3 x 2 inches. We did run into some minor glitches that disappeared after we increased the memory allocation for HyperCard to a whopping 4 megabytes (Voyager recommends the program for 4-megabyte+ Macs; we advise having at least 8).

Bruce Veder's essay on the film is good, but some factual errors do appear in the film's annotations, such as when "While My Guitar Gently Weeps" is credited to Paul McCartney instead of to George Harrison and when the writer refers to Lennon's slide guitar on "Get Back" (obviously confused with "For You Blue").

In any case, Voyager's *A Hard Day's Night* is a must-have for all Beatles fans as well as for anyone who wants to

discover how entertaining a multimedia product can be when classic source material is recast with imagination, taste, and intelligence.

The Voyager Company, 1351 Pacific Coast Highway, Santa Monica, CA 90401; 800-446-2001 or 310-451-1383. \$39.95.

—James Bradbury



Wacom ArtZ Tablet

↑↑↑↑↑

Trying to create great art with a mouse can be frustrating, but pressure-sensitive tablets are still specialty items with daunting price tags and not-yet-optimal features, right?

Wrong. Wacom's new ArtZ tablet combines well-designed hardware with impressive software capabilities at a reasonable price — and without hogging a serial port.

The ArtZ hardware offers the same responsiveness as Wacom's serially connected tablet of similar size (6 x 8 inches) but with improved comfort and convenience. The new pen is the lightest and thinnest on the market, and its side switch lets you perform several different actions, such as double-clicking or executing macros, without taking your hand off the pen. Wacom has also integrated a clear plastic template that makes tracing artwork a breeze. And because the ArtZ plugs in to an ADB (Apple Desktop Bus) port, it doesn't compete for your serial port with devices such as modems and label printers.

But the big news is Wacom's new software. The Wacom control panel allows for a tremendous variety of settings not previously available.

A pop-up menu lets you specify how you want certain pen actions interpreted. You can assign one of the following effects to occur when you tap the pen against the tablet and another to occur when you press the pen's switch: click, double-click, click lock, shift, option, keystroke, macro, screen macro, mode toggle, or ignore (turns off the pen's switch). These settings can be different for different applications.

Useful settings help you with double-clicking and with achieving precise pressure control. The double-click-assist setting lets you specify that a second click within a certain distance (measured in

pixels) from the original click counts as a double-click — a major selling point for users who know how difficult it is to click twice in the exact same spot. The pen-pressure-curve setting allows you to map a range of input pressures (the actual pressures you apply) to different output pressures (the pressures the software uses to create the screen image) along a curve.

Finally, Wacom has added macro capabilities, available through either Affinity Microsystems' Tempo II (included with the ArtZ) or CE Software's QuickKeys. The screen-macro is particularly nice; it pops up a scrolling list on-screen at your pen location so you can choose from selected macros. The Wacom software recognizes all the macros programmed into your macro program, but you can choose a smaller subset to appear on-screen.

With its excellent software and streamlined hardware, this tablet rises above all others in ease of use and value. At a street price of about \$350, the ArtZ is a must-have for artists frustrated with mice.

Wacom Technology Corp., 501 S.E. Columbia Shores Blvd., Suite 300, Vancouver, WA 98661; 206-750-8882. Version 1.0. \$449.

—Sean Safreed



ClickChange

↑↑↑↑↑^{1/2}

The Mac interface is the epitome of elegant design. But you can easily change that by putting your personal stamp on it with ClickChange. It's not for nothing that the package lists, under System Requirements, "A sense of humor."

Start with the cursor and the menus: How about a shimmering rainbow arrow cursor or a pulsating flying wedge? Instead of hands on a wristwatch, you can have a bee buzzing in a circle or a helicar bouncing around. But a fancy cursor makes the pull-down menus look awfully plain — so why not change them too? Add color to the menu bar and menu backgrounds, and then change the color of the menu text. While you're at it, assign any icon — in full color and even animation — to any menu title. You haven't fully experienced your Mac until its Balloon Help menu becomes a heart that beats when Balloon Help is active.

Colorizing is only the first step. Next,

NEW ON THE MENU QUICK CLICKS

redesign whatever is in and around your windows: Alter the boring stripes in the title bar, change the scroll-bar pattern, choose a style and size for the scroll box, and pick a style for the scroll arrows — and put two at each end of the scroll bar. Do your buttons look boring now? Of course they do, so select from a variety of styles, colors, and shading for push buttons, radio buttons, and check boxes. Then move on to revamping your desktop. ClickChange provides numerous patterns and a pattern editor that lets you use the full color palette in patterns of as many as 128 pixels square (instead of the usual 8 x 8 allowed by the General Controls control panel).

When you have everything *looking* the way you want, move on to sound. Assign any of two dozen sounds to any of dozens of events — for example, have an arrow zip into a target when you insert a disk, an elephant trumpet when you press the Caps Lock key, and a real trumpet announce the emptying of the Trash. Drive yourself (or someone else) crazy

by attaching sounds to such commonplace events as opening and closing windows or clicking the mouse. And if the standard sound selection isn't enough, get the bundle that combines ClickChange with ClickTrax, 4 megabytes of sounds and celebrity impersonations commenting on your Mac operations. The impersonations range from Reagan, Hepburn, and Elvis to more-generic voices.

ClickChange is not entirely without practical merit. It offers a menu-bar clock (with a variety of colors and sounds, of course) as well as PowerBook-specific options such as thick cursors and a cursor finder. And its double-scroll-arrows option should be built in to the system software. But don't buy ClickChange for its few practical aberrations — buy it for the fun.

Dubl-Click Software, 22521 Styles Street, Woodland Hills, CA 91367; 800-888-2068 or 818-888-2068. Version 2.0. \$89.95; bundle with ClickTrax, \$119.95.

— Sharon Zardetto Aker



How Computers Work



How Computers Work is an interactive CD-ROM that uses lavish illustrations and animations to explain exactly what its title indicates: the inner workings of computers. It also provides a look at computing, from the abacus of the Middle Ages to the biochips of tomorrow. The program combines photography, illustration, animation, voice-over, hypertext, and plain-text chapters — all of which are first-rate.

The program has six main sections — Input, Processing, Memory and Storage, Output, Programming, and Applications — each with several logical subtopics. You also get an introduction, a guided tour, a detailed historical time line, and several interactive activities. Sample versions of several popular applications —

THE COLOR YOU SEE, IS THE COLOR YOU SEE,



Original color input
from scanner, Photo CD,
or direct from your
computer.



such as QuarkXPress, Microsoft Word and Excel, Aldus SuperPaint, and Claris' FileMaker Pro — are also included (with saving and printing disabled).

The basic unit in How Computers Work is a *screen* (as in a screenful of information). Most screens feature a slide-show or animated demonstration with voice-over narration. By clicking on a book icon, you can access supplemental text adapted from the Time-Life books *Understanding Computers* and *How Things Work*.

Navigation is easy: You can watch the entire production sequentially or use a well-designed set of buttons to browse until you find a topic of interest. Each screen includes forward and reverse buttons plus hyperlink buttons that zip you to related screens. Bookmarks and a Return button (for retracing your steps) help you find your way back to a particular screen. Other navigation tools include an index and the Find command, which lets you search through the entire program or through the current topic or

subtopic for a specific word or phrase.

How Computers Work is a model of intelligent interface design, clearly presented content, and thoughtful use of multimedia. Our only complaint is that at \$80, it's a tad expensive (you also need at least an LC, a 13-inch monitor, and 4 megabytes of RAM to run it). Still, for those who are in the market for an entertaining, informative look at computers and computing, How Computers Work is one of the finest multimedia CD-ROMs we've seen.

Warner New Media, 3500 Olive Avenue, Burbank, CA 91505; 818-955-9999. Version 1.0. \$79.99.

— Bob LeVitus



CD-ROM ToolKit

Next to floppy-disk drives, CD-ROM drives are the slowest storage devices known to humankind. FWB's CD-ROM

ToolKit (a younger sibling of the company's Hard Disk ToolKit) is a set of utilities and drivers that can take some of the waiting out of working with CD-ROMs. The main feature is caching, which speeds up tasks such as opening folders and doing searches on CD-ROM.

Included in the software is a universal driver that supports CD-ROM drives from Apple, Chinon, Hitachi, Sony, Toshiba, and others, and it works with the new generation of double-speed drives too. It also provides drivers that let older CD-ROM drives read the first session on Photo CD discs and audio-discs. You can activate the CD-ROM ToolKit software for as many CD-ROM drives as you have on your SCSI chain, but you need to manually remove any older CD-ROM software first.

You set up caches in CD-ROM ToolKit's control panel. You can reserve 1 to 4 megabytes on your hard disk, which CD-ROM ToolKit uses to temporarily store data from a CD-ROM. You are also able to designate as much as 1

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CIRCLE 85 ON READER SERVICE CARD.

megabyte as a RAM cache, which is typically 100 times the speed of a disk cache. The control panel also lets you tell CD-ROM ToolKit to attempt to improve speed by storing information it expects it will need — a list of files and folders on the CD-ROM, for example, or whatever data is adjacent to the data you're currently accessing — in a cache.

We found that CD-ROM ToolKit cut the time our Mac IIfx took to open a folder from 5 seconds to less than 2. It also cut the time required to do searches, which often occur when you click on a button to get help or go to another screen; with CD-ROM ToolKit installed, searches took half the time they did before — or less, in some cases.

In some instances, such as when we ran QuickTime movies or launched applications and opened files from the CD-ROM, we found that CD-ROM ToolKit had no effect. The time it does save, however, is well worth the software's moderate price.

FWB Software, Inc., 2040 Polk Street,

Suite 215, San Francisco, CA 94109; 415-474-8055. Version 1.0. \$79.

— John Rizzo



Read-It! Pro



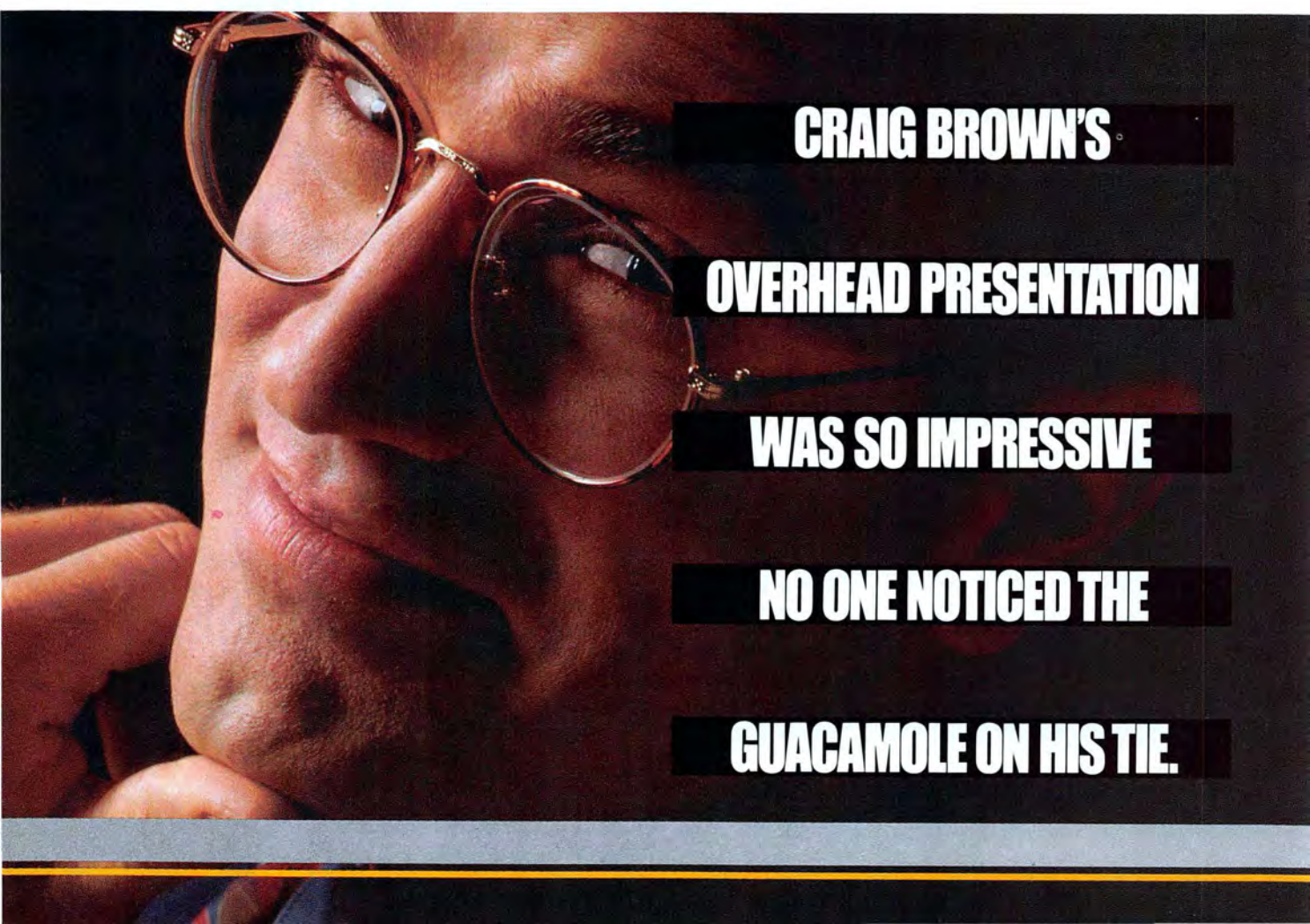
With other trainable OCR packages, such as Caere's OmniPage Pro and Xerox Imaging Systems' AccuText, listing at close to a thousand dollars, using Olduvai's \$595 Read-It! Pro sounds like a mighty attractive way to recognize scanned-in text — especially when you find out you can get it for \$199 direct from Olduvai. But you definitely get what you pay for.

Read-It! Pro offers two primary modes of OCR recognition. With enough memory (2.5 megabytes or more), it can be used in Omnifont mode — that is, to process text in any font. With less memory (1.5 megabytes) and much more effort, you can train the program to recognize specific fonts and characters.

A typical Read-It! Pro session involves scanning a page (or multiple pages), interactively selecting text blocks for recognition (or letting the program perform this step automatically), and then setting the program loose on the scanned page for recognition. You can control brightness and resolution settings for improving accuracy on difficult pages. You can also access spell checking, and by using the Send Text To option, you can scan pages directly into any other open application that also supports System 7's IAC (interapplication communication).

We compared Read-It! Pro with TypeReader and OmniPage Pro on a Mac IIfx with 8 megabytes of RAM running under System 7.1. Read-It! Pro consistently took twice as long as the two high-end products (3 minutes versus 1.5 minutes) to recognize a letter-sized page set in 10-point Times. And Read-It! Pro produced roughly five to seven times as many errors as did TypeReader or OmniPage Pro.

Read-It! Pro's accuracy increases



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GUACAMOLE ON HIS TIE.

considerably if the page is set in a sans serif font such as Helvetica or when the point size is 12 points or more. Accuracy also increases if you train the program to recognize pages set in fonts and point sizes you commonly use or receive. But this process really does take time.

We encountered bugs as well as bombs when trying to use Read-It! Pro's Send Text To option. Occasionally, the option worked; more often, the program froze, reported errors, or didn't do anything.

If you absolutely can't afford one of the more expensive OCR products and are willing to invest a considerable amount of time in training Read-It! Pro—or if you must have trainability for the type of documents you usually deal with—then maybe this program is for you. But it's too limited and too buggy to earn our recommendation for general OCR.

Olduvai Corp., 9200 S. Dadeland Blvd., Suite 725, Miami, FL 33156; 305-670-1112. Version 4.0. \$595 (\$199 direct from Olduvai).

—Gregory Wasson



Office Tracker



Although an electronic version of an office in/out board may not seem like much to get excited about, the elegance and simplicity of Milum's Office Tracker make it a pleasure to use—especially over a network.

The server software in Office Tracker's network version is similar to the standalone version of the software. You can create multiple In/Out boards, each board listing the status of the various resources you want to track: people, cars, conference rooms, keys, documents, and so on. Each board displays each resource's name, type, in or out status, time of most recent check-in (or check-out), current location, expected return time, comments, and other information.

A client application called Viewer lets you log on to the server and see any or all currently open boards. You can customize the appearance and sorting order of

boards for your own viewing. You can also sign resources in and out, but you can't necessarily sign other people in or out, because the software can be configured to prevent people from changing anyone's status besides their own.

If you don't have the time (or free memory) to use the Viewer application, you can use the Sign In/Out DA for signing yourself in or out quickly. Pressing a customizable toggle key brings up the sign-out dialog box, which lets you enter where you're going and when you'll be back. Once you've logged out, the DA keeps the sign-in dialog box on your screen until you return; press the toggle key to sign in and close the DA.

Clever touches abound in Office Tracker. It tracks your habits (figuring you'll sign out to go to lunch at noon, for example, and filling out the appropriate sign-in options for you in advance) and can notify you when particular resources are signed in or out. It records resource activity in a tab-delimited log file for easy importation into a spreadsheet or



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CIRCLE 82 ON READER SERVICE CARD.

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PS Printer



database, and it allows you to publish any part of a board (to create an instantly updating pie chart in Excel of how many people are in or out, for example). Office Tracker is also compatible with AOCE (Apple Open Collaboration Environment) and can automatically establish an ARA (AppleTalk Remote Access) connection from a PowerBook after you've done it once.

We'd like to see some enhancements, such as remote server administration, in future versions of Office Tracker, but at a little less than \$25 per user for a 20-user pack (and less than that for larger purchases), it's a great value — especially because Milum will give all users a free upgrade to the workgroup-scheduling version, which may even be available by the time you read this.

Milum Corp., P.O. Box 163985, Austin, TX 78716; 800-257-2120 or 512-327-2255. Version 1.1. Stand-alone version, \$195; 20-user network version, \$495; 50-user network version, \$995.

—Eric Taub



PixelPlay



Tired of flying toasters? Had enough of Mr. Spock? Why not turn your idle Mac into a movie screen with PixelPlay, a new screen-saver module and QuickTime-movie collection from Silicon Sports.

PixelPlay includes two pieces of movie-playing software: One is a module for use with Berkeley Systems' After Dark screen saver; the other is a stand-alone, continuous movie player that you launch with a standard double-click. The movies and the options are the same for each. You can adjust the volume and set the movies (those included or your own) to move around the screen as they play. You can also frame the movies and create film collages.

The included movies and their sound tracks should appeal to you if you like daredevil sportsmanship. They're from Warren Miller Entertainment, famous for

sports cinematography (and a good name to drop at après-ski parties in Aspen). One especially stunning scene starts with a skier poised at the edge of what looks like a 30-foot, straight-down drop-off. He pushes off and flies through the air before landing in a burst of deep, fresh powder.

Other movies show equally risky maneuvers by sailboarders and snowboarders. Movies last from 3 to 20 seconds, with most around 8 seconds. Because the movies are in QuickTime format, you can use them with other QuickTime-compatible applications, just as you can use the player or the screen-saver module to play your favorite QuickTime movies.

A few glitches mar an otherwise fun product. The manual fails to warn you that your system will crash if you use the PixelPlay module as part of After Dark's MultiModule or Randomizer options. And keep in mind that the stand-alone player (the version of the software that doesn't require After Dark) isn't a fully

MAC-TO-PC NETWORKING . . . THE WAY IT'S SUPPOSED TO BE.

functional screen saver in itself, because you have to launch it manually.

PixelPlay requires a minimum of 4 megabytes of RAM with System 7 or 2 megabytes with System 6.0.7 or later. As is generally true with QuickTime, playback quality depends on your hardware; you need at least an SE/30 (we had reasonable results with a IIcx). You also need a hard drive with plenty of room for the included movies; all ten together occupy nearly 6 megabytes.

Silicon Sports, Inc., 324 High Street, Palo Alto, CA 94301; 800-243-2972 or 415-327-7900. Version 1.0. \$49.95.

— Shelley Cryan



DupLocator

If you sometimes think certain files on your disks are cloning themselves at will, Midnight Software has a utility program for you.

DupLocator performs file searches,

cataloging, and batch processing, as do other programs such as CE Software's DiskTop, but it also offers the unique ability to list duplicate files. To every Mac user who has stumbled upon seemingly countless copies of TeachText, this feature alone makes DupLocator an attractive program.

DupLocator is quite straightforward to use. You scan your hard disk (or sequence of hard disks, network volumes, and floppy disks and other removable media) to get a list of files. You can view the files in a straight list or in a B-tree hierarchy. Choosing Duplicate Files, on the View menu, provides you with just the names of the duplicates — which you can then manipulate (move, delete, rename, and so on), either individually or in a batch.

The one thing we found disappointing about the duplicate-finding feature was that it finds duplicates by name only. As a consequence, the Puzzle DA appears as a duplicate of Puzzle, the After Dark module. The program would be more

useful if duplicate searches took the file type and creator into consideration during the searching process.

Beyond its "duplocating" features, the program has several other useful capabilities. The Batch feature is helpful for copying, moving, and deleting non-duplicate files; changing file types and creators (but only from one type/creator combination to another — you can't change several files of different types to the same type at once); and doing other tasks. In addition, DupLocator can serialize floppy disks (add a numeric prefix or suffix to the volume name — a big help in printing disk catalogs), batch-compress and -decompress StuffIt and DiskDoubler files (if you have these programs), show SCSI-chain and disk/volume information, and give you a category breakdown of a selected volume's contents (applications, documents, system files, and so on).

Conspicuously missing in DupLocator, though, is the ability to create disk labels (slated for a future version). Another lack

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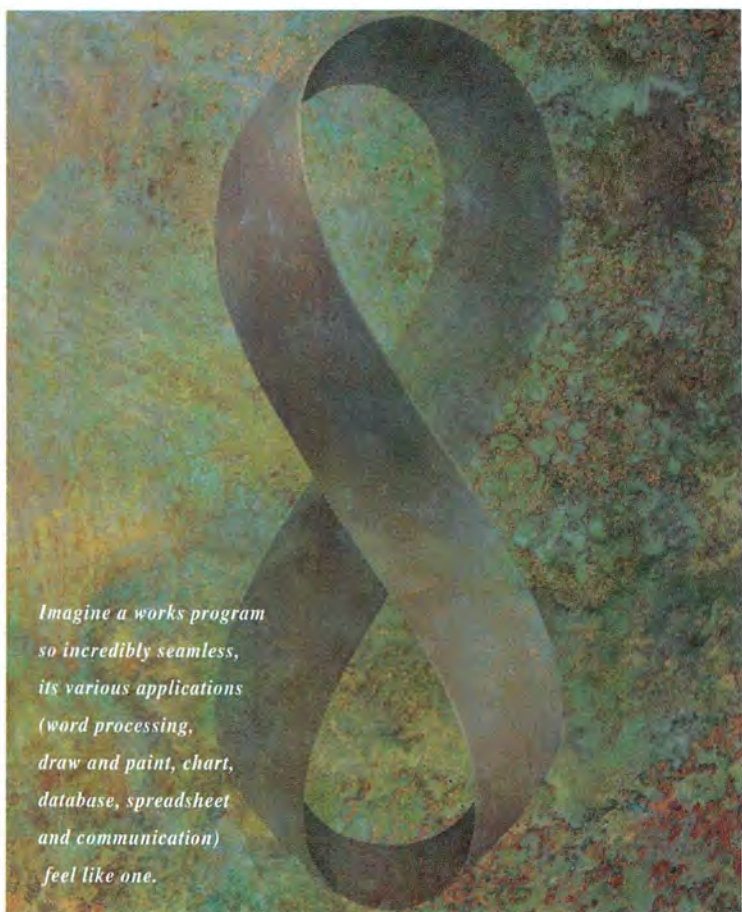
FEATURE	WORDPERFECT WORKS	CLARIS WORKS	GREAT WORKS	MICROSOFT WORKS
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Paint and Draw	256 custom	81 draw	256	NO
Common tool bar with module-specific tools	YES	NO	NO	NO
Log-in scripts/phone book	YES	NO	NO	YES
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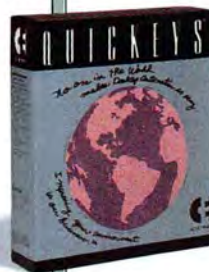


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here at Earth Lovers Landscaping, when I discovered money doesn't grow on trees. So I went digging for ways to save money and make the Earth a better, more profitable place. Which is how I found QuickKeys. With QuickKeys I have replaced repetitive tasks I perform all day — every day — with a single keystroke or a mouse click. QuickKeys allows me to plant lots of time-saving and money-saving shortcuts directly into my business.

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QUICK CLICKS

is in the area of performance: Although DupLocator isn't painfully slow, the program could definitely benefit from a speed boost.

Overall, though, Midnight has created a clean, useful product. With a few extra features, DupLocator could find itself unduplicated in success.

Midnight Software, Inc., 351 W. Davies Avenue N., Littleton, CO 80120; 303-730-3376. Version 1.0.3. \$99.

— Tom Petaccia



InfoLog

555 1/2

If you're better at pushing paper than you are at keeping track of it, Connectix has a product that can help you — if you don't mind spending a fair amount of time setting it up.

InfoLog is a specialized database application that lets you track documents or other items so you always know their location. You start by having InfoLog

print a sheet of 80 sequentially numbered labels (using Avery 5267 or 5667 laser-printer labels). The program also creates 80 database records that correspond to these numbered labels. You then stick one label on each document (or other trackable item, such as a disk, photo, slide, or piece of hardware). Finally, you type keywords and locations (file cabinet, drawer D, tray 6, and so on) for the items in their corresponding database records. When you fill up the initial 80 slots, you print out 80 more labels and begin anew.

InfoLog provides searching and sorting tools so you can organize your entries in various ways. You can also select records in the main list window simply by clicking on them (multiple and noncontiguous selection is also supported). InfoLog automates keyword entry by putting keywords you have already used in hierarchical menus where you can select them to be entered in the current record. In addition, you can print copies of your database or current

selection, and you can export records as tab-delimited text.

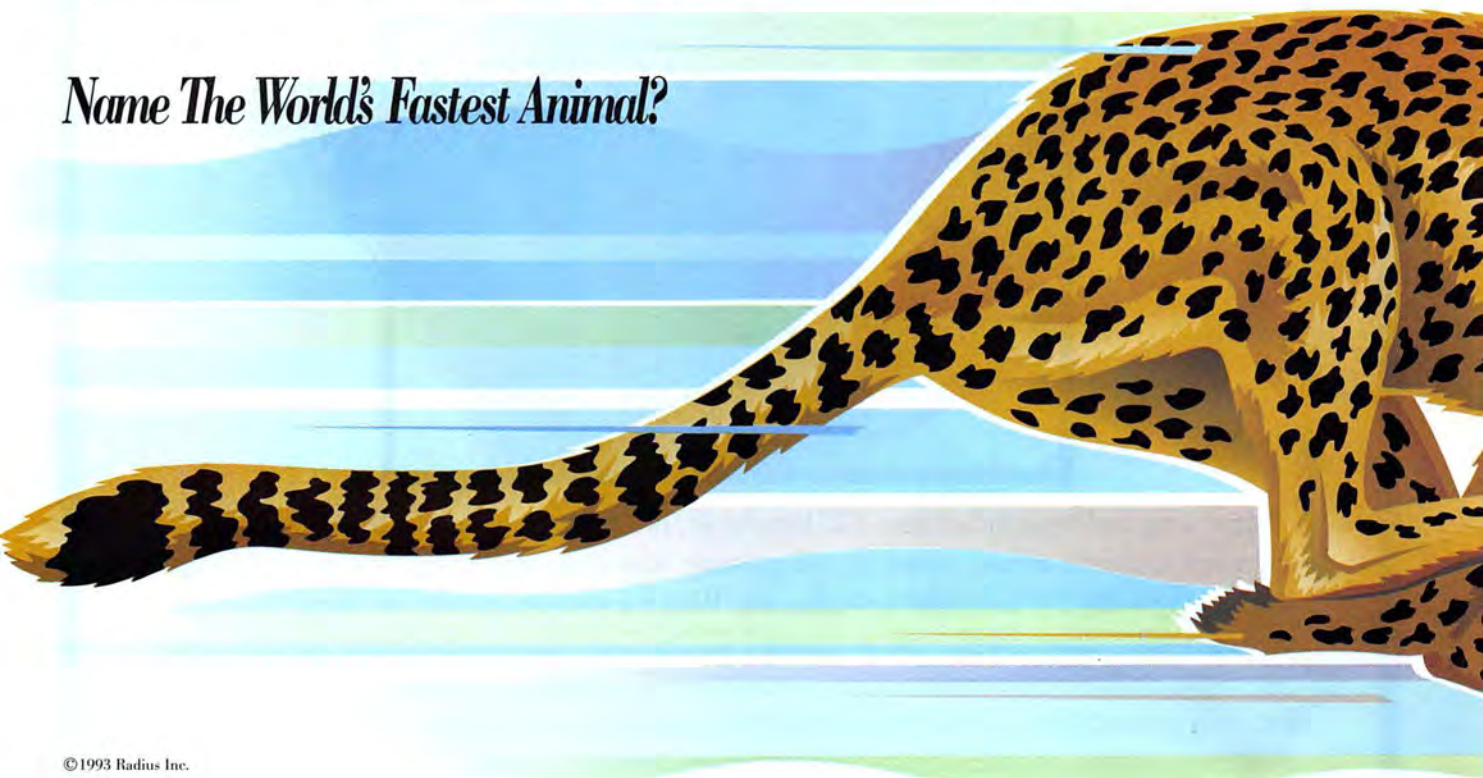
Some aspects of InfoLog's interface struck us as less than intuitive. Keyword and location management can be unwieldy and confusing — for example, to add a new location, you go to the Windows menu (instead of the Locations menu), open the Locations window, and choose New Location. Also, the manual is vague and incomplete in several places — make certain you check the read-me file on the distribution disk for valuable tips.

InfoLog saves you the trouble of trying to set up a similar tracking system in a regular database program such as FileMaker Pro or the database module of a "Works" product. It is marred by some interface quirks and is a bit pricey for what you get, but it's rock solid and generally easy to use.

Connectix, 2655 Campus Drive, San Mateo, CA 94403; 800-950-5880 or 415-571-5100. Version 1.1.1. \$149.

— Gregory Wasson

Name The World's Fastest Animal?



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CIRCLE 107 ON READER SERVICE CARD.

QUICK CLICKS



Bestbooks



All accounting packages promise ease of use, but most expect you to be pretty familiar with accounting principles and terms in order to set up your books and get to the "easy to use" part. Not Bestbooks. It lets you track receivables and payables, print invoices, and track jobs without knowing a word of accounting-ese. Instead of *debits* and *credits*, you find plain-English terms such as *spend money* and *receive money*.

Bestbooks comes with a large selection of account lists that are appropriate to common occupations. To set up your books, simply select the account list that most closely matches your occupation. That's it. You can begin writing checks, invoices, and purchase orders right away. You can also enter opening balances and unpaid receivables and payables whenever you get around to it. (Remember that if you never get around to it, reports

may turn out to be inaccurate.)

You navigate through Bestbooks' functions from the Command Center. Click on one of the seven function buttons at the left, and the main window displays a flowchart of buttons representing activities related to that button.

Click on Lists, for example, to set up and customize your account list, inventory list, job list, invoice comments, and shipping methods. The inventory list stores item names and prices for easy entry into invoices. Because Bestbooks doesn't track which items are bought and which ones are on hand, it can't calculate the cost of sales or margins. It does report item quantities sold.

Three other logically named functions help you with banking, buying, and selling: Click on Checkbook to spend, receive, or transfer money and reconcile checking accounts; click on Purchases & Payables to enter purchases and payments to vendors and to settle returns; and click on Sales & Receivables to enter and print invoices and statements, enter payments

received, and settle credits and returns.

You also get functions for ordering custom forms, entering and managing contacts (Bestbooks can auto-dial them and print or export mailing labels for them), and performing various administrative tasks.

Bestbooks does not provide automatic calculation of payroll deductions, inventory management, or multiuser-operation capabilities. But its quick setup, extreme flexibility, simple interface, and low price make it an excellent choice for individual and small-company bookkeeping.

Teleware, Inc., 300 Roundhill Drive, Rockaway, NJ 07866; 800-322-6962 or 201-586-2200. Version 1.0. \$99.

— Darryl Lewis

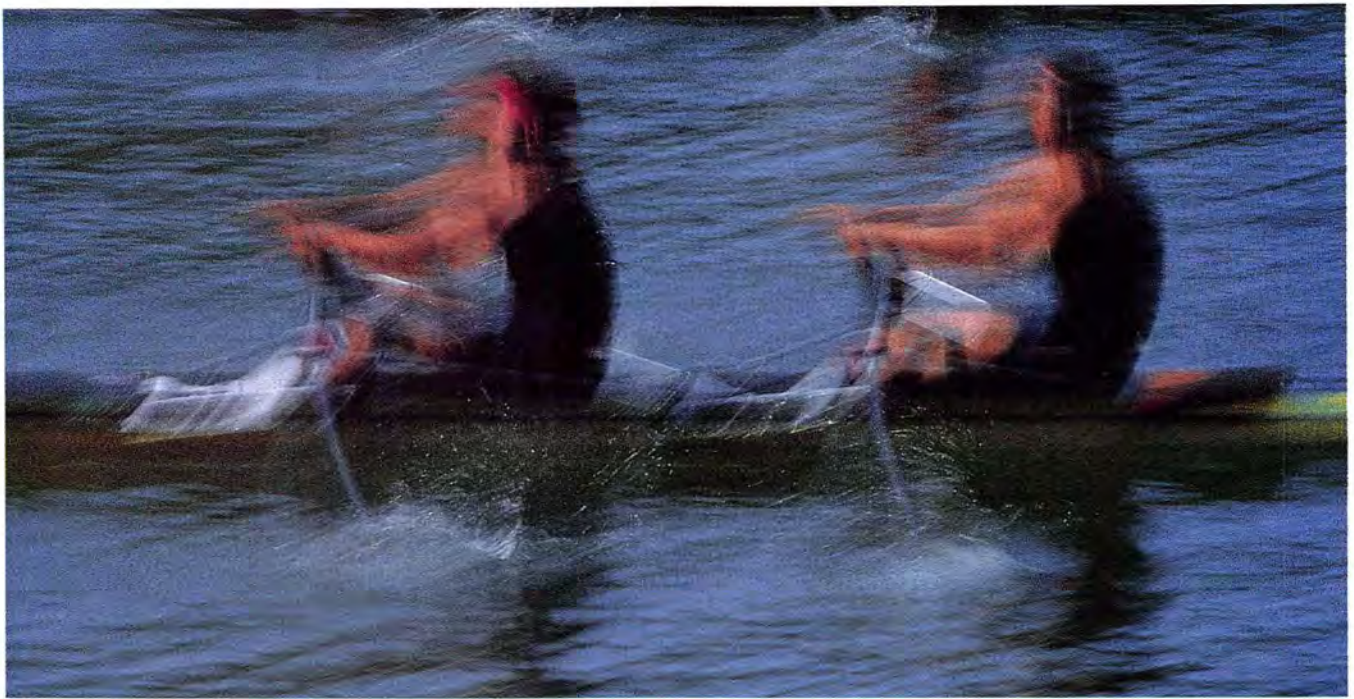


Flo'



Three words best describe Flo': *digital Silly Putty*. Remember the rubbery stuff you used to press onto comic books?

Name The World's Fastest Airplane?

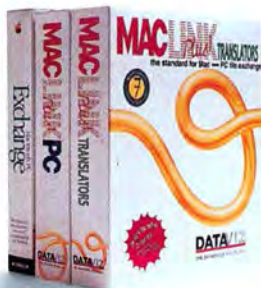


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Macintosh PC Exchange makes DOS disks appear on the Mac desktop and shows their contents as Macintosh files and folders. New Macintosh Easy Open is a System 7[™] extension that helps you open Mac or PC files when the application that created them isn't on your Mac. These technologies from Apple teamed with our translators offer the most complete solution to file transfer and translation available in a single package.

MacLinkPlus contains over 700 conversion paths to and from all popular word processing, spreadsheet, database and graphics applications. Files are converted quickly and easily, with all of their original formatting intact.

In addition to providing you with transfer capability, MacLinkPlus also translates files transferred via other methods. Such as disk mounting utilities like DOS Mounter and AccessPC,

MS-DOS emulators such as SoftPC, and network software such as NetWare and LANtastic. Let MacLinkPlus do the work of converting foreign files transferred with these products into the exact format you need. MacLinkPlus/Translators contains the full translator library, Macintosh PC Exchange and Macintosh Easy Open. While MacLinkPlus/PC has all of these, it also allows you to connect a Mac and PC with the included serial cable or via modems.

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The pictures transferred to the Silly Putty, and you could then stretch it to give Superman a pointy head or to enlarge Dick Tracy's jaw. That's what you can do to digital images with Flo', a new entry in the growing category of image-distortion and animation tools.

Flo' enables you to distort PICT files at any resolution by using tools from a floating tool palette. Skew, rotate, scale, and do 4-point distortions (to create pointy heads or perspective effects) on either an entire image or just a selection. You can also relocate portions of the image to, say, move eyes closer together. Save resultant images as PICT or TIFF files, or save the process as a series of PICTs, a QuickTime movie, or a PICS animation.

The true beauty of Flo' is in how well it handles the area surrounding the distortions. If you twist an ear, the adjacent head area distorts accordingly, with no digital artifacts. "Flo'd" people resemble caricatures, and objects take on a Dali-esque quality.

Unfortunately, Flo' is slow. Using a Mac IIcx (Valis, the maker of Flo', recommends at least a Mac II and 4 megabytes of available RAM) and a 300-dpi, 254-x-359-pixel color image, we found that a nose rotation took 30 seconds. Saving a series of three transformations as a 16-frame QuickTime movie ate up nearly 14 minutes.

Setting up an animation is tedious. You can set an unlimited number of keyframes (frames specifying the state of an image at particular points in a sequence and between which the image is altered). Yet you must display the images on-screen, one at a time, to select them as keyframes.

Therefore, you've either got to create transformations in the order you plan to use them or you must cycle through time-gobbling Undos as you locate desired transformations. We would like to see a window with thumbnails of transformations, so you could point and click to set keyframes. A preview window showing keyframes in order would also be a

helpful addition to the program.

Although the processing time can be substantial and a few un-Mac-like elements (no scroll bars and an odd Undo function) can send you scrambling for the inadequate manual, Flo' is generally easy to use and the results can be eye-popping — in more ways than one.

The Valis Group, P.O. Box 422, Point Richmond, CA 94807; 510-236-4124. Version 1.2. \$199.

— Shelley Cryan

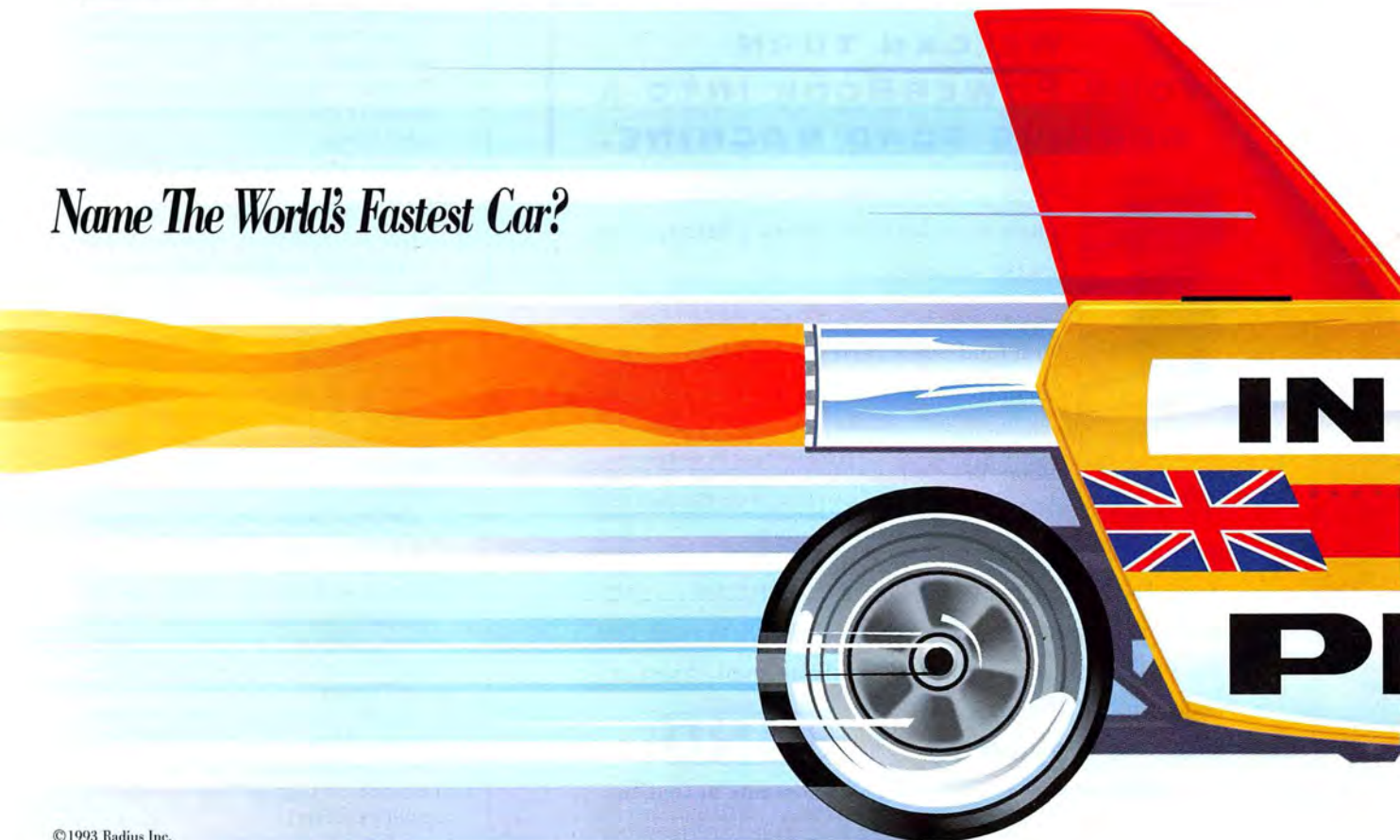


Spelling Coach Professional



If your hard disk is bloated with spelling dictionaries installed by every application under the sun, you may want to chuck them all in favor of one universal spelling checker such as Deneba's Spelling Coach Professional.

Name The World's Fastest Car?



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CIRCLE 44 ON READER SERVICE CARD.

NEW ON THE MENU QUICK CLICKS

Coach works much like Baseline Publishing's Thunder 7, the premier Mac spelling checker, does. It adds a menu to the menu bar that lets you control spell checking from within nearly any application. Oddly enough, the Coach menu does not give you access to the control panel where you set up the applications in which Coach will be active, so you're in for an occasional trip to the System Folder. Coach can spell-check interactively as you type in text; you can also specify when you want it to check an entire document or a selection of already-entered text.

The big advantage with Coach is its wealth of words. Its 95,000-word main dictionary is considerably larger than that found in Thunder 7, and Coach comes with three additional dictionaries that supplement the main dictionary with legal, medical, and technical terms. You can also add your own words directly to the main dictionary and edit it at any time.

Coach provides excellent thesaurus and definition-lookup options as well as the ability to load dictionaries into RAM or leave them disk-based (useful for Macs with limited memory). There's also a hyphenation module that lets you hyphenate or check the hyphenation of selected words.

Coach does have disadvantages, however. Its lack of a Thunder 7-type glossary feature for recognizing an abbreviation as you type it and replacing it with the full word or phrase will be a fatal flaw for some users. Coach also lacks Thunder 7's batch mode for search-and-replace operations — this feature lets you replace a list of words with other words, all in one process. Finally, we found Coach's interface somewhat confusing and cluttered. Too many windows pop open and close during spelling checks.

Spelling Coach Professional doesn't really measure up to Thunder 7 in convenient features and ease of use. But its larger main dictionary, its three specialized dictionaries, and its RAM/disk dictionary option will be more than enough reason for some users to prefer Coach over Thunder 7.

Deneba Software, 7400 S.W. 87th Avenue, Miami, FL 33173; 305-596-5644. Version 4.0. \$195 (\$49 direct from Deneba as an upgrade from a competing spelling checker).

— Gregory Wasson

Introducing Radius' PrecisionColor™ Pro.

Now it joins the cheetah, the Thrust II car and the SR-71 spyplane on the list of world-class speedsters.

Because PrecisionColor Pro is the fastest 24-bit color graphics card available for the Macintosh®. Period.

It's up to 67% faster overall than Thunder/24™. Up to 26% faster overall than Thunder™ II. And as much as 3000% faster than your unaccelerated Mac*.

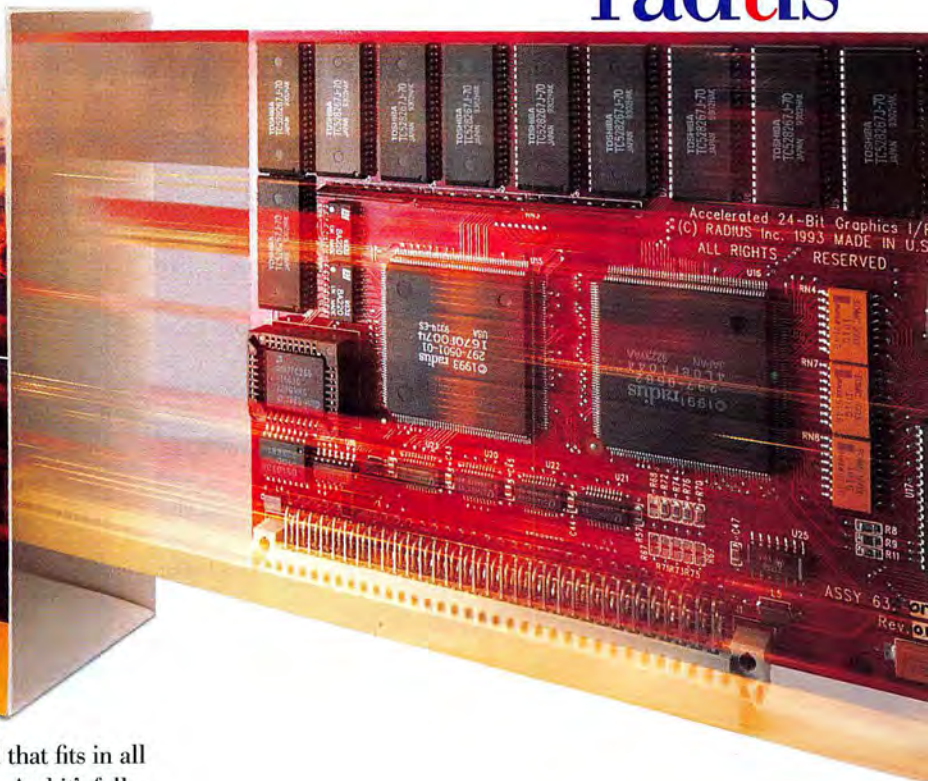
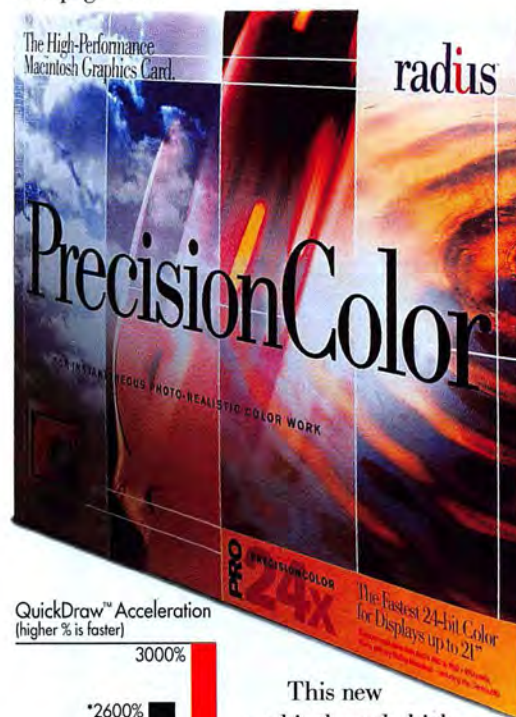
So now you can really scream through color imaging, photo retouching, illustrations, 3-D renderings, and other graphics-intensive work.

And to really accelerate Photoshop®, there's our new PhotoBooster™ with twin DSPs, to help you run your production functions up to 15 times faster than a Quadra™ 950.

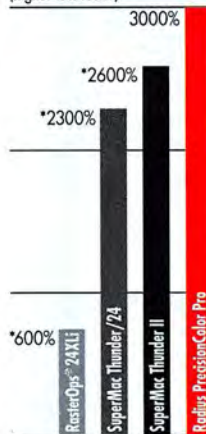
In addition to unmatched speed, PrecisionColor Pro gives you unrivaled flexibility. You get "on-the-fly" resolution switching. A single keystroke moves you between one-page and two-page views.

The World's Fastest Graphics Card Has Just Been Named.

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radius



QuickDraw™ Acceleration
(higher % is faster)



*Performance percentages from publications by RasterOps Corp. and SuperMac Technology, Inc.

This new card is the only high-performance graphics card that fits in all Macintosh NuBus™ systems. And it's fully compatible with a wide range of monitors, including our new IntelliColor™/20 display.

The price? Just \$2,499. Fully backed by our Worry-Free Warranty, with overnight replacement.

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Get PrecisionColor Pro. And start setting some world records of your own, fast.

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CIRCLE 68 ON READER SERVICE CARD.

THIS SHOULD GIVE YOU OF WHY WE CREATED AN

The image you see over there started out attached to the image you see over here. But as this document made its way down to the printer, the Macintosh it was created on recognized a small problem: 11 x 17 pages can't fit through 8½ x 11 printers.

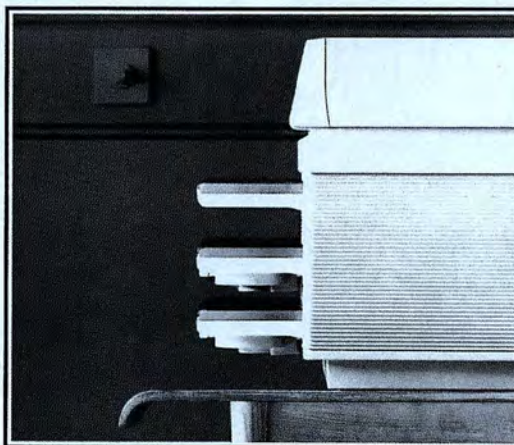
And so, out came the electronic scissors.

Now, if you're like many Macintosh users, you know all about this routine. And you know how it feels to walk into a meeting with a layout that contains hours of blood, sweat and tears, and a fat strip of tape right down the middle. Enough said.

Introducing the new

COMPAQ PAGEMARQ Laser Printers. A line of

paper trays, these printers also let you switch between paper sizes without ever leaving your desk. So you don't have to pull one paper tray out and replace it



machines that can print 11 x 17 pages in a single pass. And because they come with up to three paper trays, these printers also let you switch between paper sizes without ever leaving your desk. So you don't have to pull one paper tray out and replace it with another, only to have your neighbor repeat the process two minutes later. And for

*This service, provided by contract service providers, is specific to hardware products and may not be available in certain geographic locations. Consult the Compaq Customer Support Center for further details. ©1992 Compaq Computer Corporation. All Rights Reserved.

A PRETTY GOOD IDEA IN 11 X 17 LASER PRINTER.

people whose design ambitions extend beyond Helvetica Bold, PAGEMARQ Printers offer two ways to expand your type library, eliminating the need to

Modules, and store as many as 40 additional fonts. Or you can add an internal 60-MB Hard Drive, and store everything from Avant Garde to Zapf Chancery—as many as 1,500 fonts.

All of which print with amazing clarity thanks to the 800x400 dpi high-resolution mode—a feature that delivers razor-sharp type and graphics as well as

smooth, high-definition gray scales.

Of course, the new COMPAQ PAGEMARQ

Laser Printers are fully backed by CompaqCare, our extensive service and support program. Which includes a one-year, on-site* limited warranty as well as unlimited phone support.

All at no additional charge whatsoever.

If you're interested in learning more, simply call 1-800-345-1518 in either the United States or Canada.

We'll show you how to keep your big ideas in one piece. At least until your client sees them.



A typographer's dream, these printers can store 1,500 fonts. Of course, not all of us dream about type. In which case, the 35 fonts that come standard are more than adequate.



Add an Internal FAX Modem and you can turn your Mac into a personal fax machine. One that will send and receive PostScript quality faxes in any size up to 11x17.

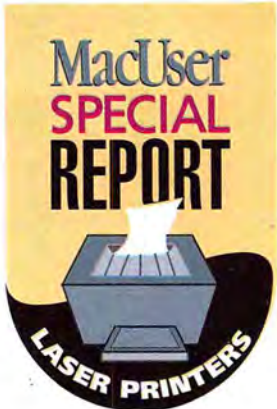


continually download from your Macintosh. You can add 1- and 2-MB Programmable Font



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CIRCLE 80 ON READER SERVICE CARD.



Choosing the Right LASER PRINTER

Dozens of vendors, scores of printers. Paper handling and networks. Your challenge is not just which printer to buy but also how many.

BY BRUCE FRASER

What's Inside

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page 133

Rating Tech Support
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Workgroup Printers
page 146

Departmental Printers
page 158

Buying a PostScript printer has never been easier — on the wallet. But in every other respect, choosing a printer is more complex than ever. PostScript printers used to offer 300 dpi (dots per inch), handled paper as large as legal-sized, connected to a Mac via LocalTalk, and came with a variety of engine speeds. It was relatively easy to base a purchase decision on cost and speed alone. But that's all changed. Although cost and speed are still important factors, they're no longer the only issues.

You now have far more choices: output quality, the interfaces a printer provides, paper-handling capabilities, and duty cycles. If your network includes PCs as well as Macs and you all plan to share the same printer, you'll want to consider whether it offers additional emulations such as HP-PCL and HP-GL (Hewlett-Packard's Printer Control Language and Graphics Language, respectively). You'll also want to consider whether it offers parallel and EtherTalk connections in addition



Chooser

Select a LaserWriter

Personal Printers

Workgroup Printers

Departmental Printers



AppleShare



LaserWriter

AppleTalk Zones

Accounting

Art Department

Sales & Marketing



to LocalTalk and how easy it is to switch among the interfaces and emulations.

To help you navigate the maze of options, *MacUser* rounded up a herd of the latest and greatest PostScript printers, ranging from low-cost personal printers to departmental behemoths, and had ZD Labs put them through an exhaustive battery of tests. But to make it easier for you to find the right printer, we decided to begin with a discussion of how to analyze your needs. Rather than trying to cover all 38 printers in one enormous story, we've divided the printers into three categories — personal, workgroup, and departmental — and organized our results into separate reports for each category.

If privacy and convenience are more important to you than how fast your printer churns out pages or how many pages it can produce each month without working itself into an early grave, a compact, quiet personal printer is ideal. But don't give it too much to do: A personal printer is designed to fill the printing needs of one person or to be shared by two or three users in a small office — it can produce 3,000 to 8,000 pages per month (see our special feature-table foldout in this report).

A typical workgroup printer, on the other hand, has a printing engine that's rated about twice as fast as that of most personal printers and that can easily support a busy

office. Monthly *duty cycles* — the recommended pages-per-month rating — of workgroup printers average around 10,000 pages, with some heartier models rated at as many as 20,000 pages. Some also let you print on *tabloid-sized* paper (11 x 17 inches), a real boon for desktop publishers and financial officers who want to squeeze numerous spreadsheet cells onto a single page.

But if you really want to get serious about page after page of high-speed printing, look at a departmental printer. These powerhouses take up where workgroup printers leave off, with monthly duty cycles ranging from 20,000 to a full 200,000 pages per month and printing engines rated from 15 to 32 pages per minute — enough to churn out reams of documents.

Of course, you should take these divisions — personal, workgroup, and departmental — as guidelines rather than as hard-and-fast rules. It's unlikely that you'd want to use a 30-page-per-minute, auto-collating, emulation-switching monster as your personal desktop printer (for one thing, you'd need a very big desk). But depending on the type of work you do, you might be happy using one of the designated workgroup printers as a personal printer. Conversely, some workgroups may find that a model we've classed as a personal printer will fill their needs.

LABS How We Tested Laser Printers

Because user needs differ, testing a printer requires more than finding out how fast and how crisply it can print a single document. An 8-ppm workgroup printer would soon frustrate a large, busy department. Similarly, a departmental printer is much too loud — not to mention expensive — for a single user.

At ZD Labs, we connected each personal printer via its LocalTalk port to a Mac IIci. (The Apple LaserWriter Select 310 has no AppleTalk connection, so we connected it via its serial port.) We connected the workgroup and departmental printers via their EtherTalk port, if available, or via LocalTalk. We tested all the printers at their highest resolutions and enabled any appropriate resolution enhancements. The printers that supported emulation and port switching were connected to a Northgate SP433 486DX/33-based PC for multiplatform compatibility testing.

We used a Mac IIci with an 80-megabyte hard drive, running System 7.1. The Mac IIci had 8 megabytes of RAM, with the RAM cache set to 32K. We enabled 32-bit addressing, disabled virtual memory, turned menu blinking off, and turned background printing on (with

PrintMonitor's memory partition set to 100K). We used the AppleTalk drivers LocalTalk 58.0 and EtherTalk extension 2.0 (for the Apple Ethernet NB Card).

We performed each test three times, using a stopwatch to time the interval between when we clicked on the Print button and when the last page landed in the output bin. We then averaged the results for ranking relative performance.

We used a suite of documents that

were designed to simulate the requirements of personal, workgroup, and departmental users. First, we printed a 50-page Microsoft Word 5.1a file formatted in 12-point Times Roman, a printer-resident font, to test real-world engine speed. Second, to test processor speed and memory-handling ability, we printed a single-page Adobe Illustrator 3.2.3 document containing 15 nonresident Adobe Type 1 fonts.

We used Adobe Photoshop 2.01 to



Straight-text test document



Font-download test document

How Fast Is Fast?

In making your decisions, first consider the type and volume of work you need to print. Obviously you don't want to wait any longer than you have to for your print jobs. But printer speed as stated by vendors — as a number of pages per minute (ppm) — isn't a reliable guide to the actual results you'll get. The ppm rating applies only to the *printer engine*, the part of the printer that puts the marks on the paper. Equally important to the real-world performance of a printer is its built-in *RIP*, or raster-image processor, which interprets the PostScript code sent to the printer and tells the engine where to put those marks on the paper.

A printer runs at its rated engine speed if you print multiple copies of the same page — once the page has been interpreted by the RIP, the engine can churn out copies at full speed. That's hardly a typical use of a PostScript printer, though. Normally, you want to print a single copy of multiple pages, each of which needs to be interpreted.

The type of document you typically print makes a difference to whether you should place more weight on engine speed or on RIP speed. For text documents that use *printer-resident fonts* (fonts that are built in to the printer), the RIP has little effect on printing speed: The

faster the printer engine, the faster the pages print. If you include even simple graphics, the RIP has a larger role to play, and if you use complex PostScript graphics produced with applications such as Adobe Illustrator or Aldus FreeHand, the RIP generally plays a much larger role than the engine — a 4-ppm printer with a fast RIP can often outperform an 8-ppm printer with a slow one.

If you're buying a printer for a network, again, consider the types of documents you need to produce. If the work is fairly homogeneous, a single workgroup or departmental printer makes sense: You'll have only one set of consumables and one maintenance contract to worry about. But if you've got a small art department printing graphics within a larger workgroup that mainly produces text, you might find yourself with a bottleneck. Consider equipping the smaller group with a separate low-cost, low-ppm printer that has a fast RIP, rather than expecting one printer to handle everything.

Know Your Wires

Another factor that affects printing speed is the network interface. LocalTalk is built in to every Mac and almost every PostScript printer, but it isn't the speediest. EtherTalk is becoming more and more prevalent on Mac networks, although not all printers currently support it.

create the third document, which contained a 4-x-5-inch 300-dpi gray-scale image and vertical and horizontal gray ramps, designed to test gray-scale-printing speed. We also used this document to judge image quality. To test each printer's complex-PostScript-processing power, we used a multilayer line illustration, also created with Adobe Illustrator.

The final document, created with QuarkXPress 3.11, was designed for testing multiple aspects of printer speed

and also for judging print quality.

We set the printers equipped with LocalTalk as well as EtherTalk connections to their nondefault settings (EtherTalk for the personal and workgroup printers, LocalTalk for the departmental printers) before printing the Illustrator font-download and the Photoshop gray-scale documents. Printers capable of multiple resolutions were set at their lowest resolutions for the Photoshop gray-scale test.

In addition, we used the Northgate SP433 and the Mac Ilci to test manufacturers' claims of port/emulation-switching capabilities by printing multiple PostScript and HP-PCL 4 files at brief intervals, recording whether the printer performed the switching function correctly. We also tested each printer's TrueType compatibility by printing a single-page Illustrator document that contained one TrueType font.

— Edward O. Griffin



Gray-scale test document



Complex-PostScript test document



Page-layout test document

Why PowerBook is popular with people who know nothing about computers.

Always in touch. By adding AppleTalk Remote Access software and an internal fax/modem, users stay connected to all the network resources.

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There are literally hundreds of technical reasons why our Apple® PowerBook™ computers are the country's best-selling notebooks. But the biggest reason isn't technical at all.

That is, anyone can pick up a PowerBook and get things done right away. There's no need to learn strange commands or deal with confusing system configuration files, as there is with other notebooks.

And because PowerBook computers are so easy to use, they get used

more often. Which can help make people noticeably more effective in their work and more successful in reaching their goals.

No matter how far PowerBook users travel, they can easily retrieve files from their desktop computers. Access information from the company database. Exchange e-mail messages. Even send and receive faxes.

Now people in every kind of business are using PowerBook to make dramatic leaps in productivity. They're finding it doesn't matter how much they know about computers — as long as they have the right computer.

Why PowerBook is popular with people who know everything about computers.

An easy decision. PowerBook is easier for a company to set up and easier for people to use — so it's easier to support.

Tailored to everyone. PowerBook computers are the affordable way to give a full-featured notebook to everyone in the company — from the sales force to the CEO.

A range of choices. Four models with built-in floppy drives offer a choice of screens (black-and-white, gray-scale or color), video-out capability and processor speeds. Two PowerBook Duo® models turn into expandable desktop systems when used with the Duo Dock.

Simple connections. PowerBook has a full set of built-in ports and easy-to-use communication software, so users stay connected wherever they go.


Fits into the office. The optional PowerBook/DOS Companion® package provides software and connectors to work with MS-DOS files, printers and displays you already own.



PowerBook has also built a large following among the world's most discriminating computer audience: people like you, whose business it is to know computers inside and out and who make the hard decisions about their companies' information systems.

That's because, unlike other notebooks, PowerBook is more than a miniaturized version of a desktop computer. Its award-winning design acknowledges that there is a fundamental difference between the way people work at their desks and the way they work outside of the office.

With its extraordinary ease of use, PowerBook takes client-server computing to a new level of simplicity and mobility. From any distance, people can use innovations like AppleTalk® Remote Access for easy and secure access to the office network resources. And because PowerBook is less complicated than other notebooks, it demands far less support.

For all these reasons, more and more companies are depending on PowerBook. After all, you don't have to be an expert to recognize this kind of power. The power to be your best. Apple 

You can use an external Ethernet adapter, but it will add considerably to your bottom-line cost.

If you work on a network that has Macs as well as PCs, you'll probably also want a parallel interface, because most PCs are set up to print with this type of connection. You'll also likely want some other printer language in addition to PostScript — many PC-based applications print faster with PCL than with PostScript. If you plan to use both PCL and PostScript on your network, look for a printer that can sense which kind of data is coming in and switch emulations automatically. This will save a considerable amount of time that would otherwise be spent manually switching the printer between PCL and PostScript.

Beyond Speed

Printers capable of handling tabloid-sized paper were once an expensive specialty. They're still a little more expensive than those that handle only legal-sized paper, but if you work with large spreadsheets or tabloid-sized layouts, they're worth the extra cost.

Similarly, printers with resolutions greater than 300 dpi were once the exception rather than the rule. Now resolutions of 400 and 600 dpi are commonplace, and you'll find quite a few examples on the following pages. Many are more expensive, but their output quality is unmistakably better than that of most 300-dpi printers without resolution enhancement. If you plan to use a printer to produce camera-ready copy, one with a higher resolution is worth a look. If you want to produce camera-ready halftone images, one with a higher resolution is a necessity. We also suspect that in a year or so, even

for everyday business correspondence, unenhanced 300-dpi output may begin to look almost as crude as dot-matrix print does now.

Print Volumes

Consider the volume of work you need to get out of a printer. Most vendors now give a duty-cycle rating in pages per month as well as a printer lifetime rating of a given number of pages. These aren't absolute numbers — a printer rated at 5,000 pages per month won't suddenly explode if you print 5,300 pages in a 30-day period, and printers that reach the magic lifetime number of pages don't suddenly stop working. But if you consistently push the printer beyond its rated duty cycle, you're likely to suffer paper-handling problems or worse. Printers that have reached the end of their life cycles are usually more prone to paper jams and may need replacement of major engine components.

By the time that happens, it may be less expensive to replace the printer, at least if the technology continues to evolve at its present pace, so it isn't worth paying the premium for a far higher duty cycle than you need. If you print only 5,000 pages a month, it makes little sense to buy a printer rated for 20,000 pages per month with a lifetime rating of half a million pages.

Tray Chic

Next, consider whether your work can benefit from special paper-handling options. Most multitray printers can switch automatically to a second tray when the first is emptied, cutting down on your trips to the printer. Others, with more-sophisticated software, let you print

PostScript Reaches a New Level

PostScript Level 2 — the next generation of Adobe's industry-standard *PDL*, or page-description language — has been available in printers for two years. However, its advantages have been unclear, because of a lack of software — in particular, a Level 2-aware printer driver. At press time, Adobe and Apple were poised to ship their versions of this long-awaited missing piece.

Based on a quick look at prerelease versions of Adobe's PSPrinter 8.0 and Apple's LaserWriter Printer Driver 8.0, the new driver will make a significant difference to the performance of Level 1 and Level 2 printers. However, the differences will be most dramatic for Level 2 printers — especially color ones — particularly when printing complex PostScript files and those containing large bit maps. The new driver generates more-compact code and uses

more-efficient Level 2 operators when it's printing to a Level 2 printer. It also uses compression on bit-mapped images to speed transmission from the host to the printer.

Another aspect of the new Level 2 driver is that it lets you control printer-specific features such as paper-tray selection and switchable resolutions directly from the host computer. It can therefore replace the software that some vendors ship with their printers to provide such functions.

We're also beginning to see the first PostScript Level 2-clone printers, such as the QMS 860 Print System, and we expect to see more in the near future. Phoenix Technologies, developer of the PhoenixPage PostScript-clone interpreter, has announced not only a Level 2 version of its interpreter but also its own Level 2 driver. Several flavors of

PostScript Level 2 will be available, and we suspect that the Level 2 clones will have far fewer compatibility problems than was common in the early days of PostScript clones.

Level 1 printers are far from obsolete. If your work consists primarily of producing text, you'll see little difference in performance between a Level 1 and a Level 2 printer. Similarly, if you use applications that generate their own PostScript code, such as Adobe Illustrator, Aldus FreeHand, Aldus PageMaker, or QuarkXPress, you won't see any difference until they've been revised to use Level 2 operators when possible. But if you print significant amounts of bit-mapped art, such as scanned images or clip art, you'll get a significant benefit from the combination of a Level 2 printer and a Level 2 driver.

— Bruce Fraser

Conservative.

Populist.



Finally, someone has brought high-quality color and black & white printing to the people.

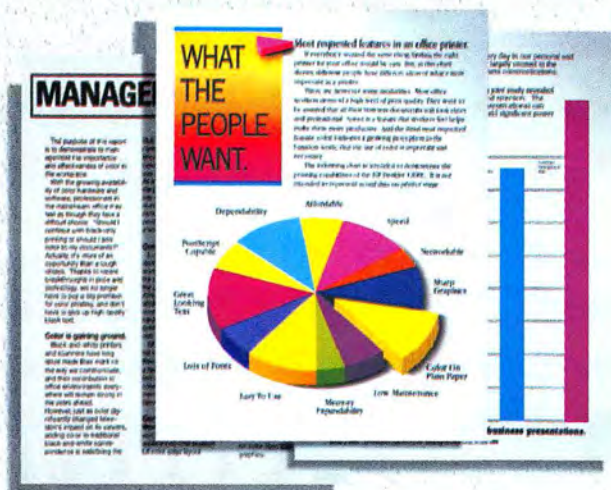
The HP DeskJet 1200C/PS printer with built-in PostScript™ software represents a new class of DeskJet printers, and it will change the way Mac users think about printing in the office.

Now anyone can access liberal amounts of color. The DeskJet 1200C/PS prints bright, sharp color graphics and type on plain paper. For the clean, conservative look, it prints sharp black & white, too. At business-printer speeds of up to six pages per minute.

Adobe's PostScript™ Level 2 software and 35 Type 1 typefaces are built in. So is LocalTalk, for easy networking. Memory is expandable and, because the DeskJet 1200C/PS is LaserJet compatible, it's as easy to use as a LaserJet printer.

To find out more about the perfect printer for the masses, just call 1-800-552-8500, Ext. 7596 for the name of the HP dealer nearest you.†

An office printer for everyone.



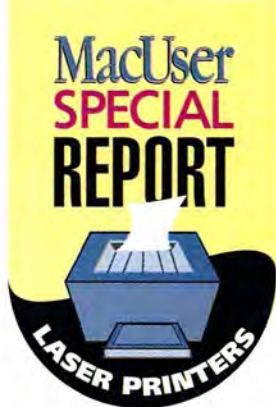


Hardware: If you need tabloid-sized output — 11 x 17 inches — as well as the familiar 8.5-x-11-inch letter-sized, you've narrowed your choices to 11 printers. Each printer's *ppm* (pages per minute) *rating* and recommended monthly usage (*duty cycle*, in pages) are also critical considerations. If your work includes complex documents, make sure to stock up on RAM. ROM-based fonts speed processing considerably, and a SCSI port — either internal or external — lets you connect a hard drive for speedy font retrieval. Choose a printer that offers the appropriate port for your network (if it's optional, we've listed the price), and if you're using your printer with PCs as well as Macs, you'll want it to receive data through multiple active ports.

Tabloid output	Pages per minute	Monthly duty cycle	RAM (standard)	RAM (as tested)	RAM (max.)	Fonts in ROM	SCSI for hard drive	LocalTalk	EtherTalk	Parallel	Serial	All ports active
○	4 ppm	8,000	3 MB	3 MB	4 MB	37	○	●	○	●	●	●
○	4 ppm	6,000	2 MB	4 MB	4 MB	17	○	●	○	●	●	●
○	8 ppm	3,500	8 MB	8 MB	32 MB	35	●	●	\$499	●	●	●
○	5 ppm	not rated	1.5 MB	5.5 MB	5.5 MB	13	○	○	○	●	●	○
○	4 ppm	not rated	2 MB	4 MB	6 MB	36	○	●	○	●	●	●
○	4 ppm	3,000	2 MB	4 MB	4 MB	17	○	●	○	○	●	●
○	4 ppm	8,000	2 MB	3 MB	5 MB	35	○	\$30	○	●	●	○
○	6 ppm	6,000	2 MB	4 MB	5 MB	35	○	●	\$499	●	●	●
○	4 ppm	8,000	12 MB	12 MB	32 MB	35	\$299	●	\$499	●	●	●
○	5 ppm	3,000	2 MB	4 MB	6 MB	35	○	●	○	●	●	●
○	8 ppm	20,000	4 MB	8 MB	32 MB	35	○	●	○	●	●	●
○	8 ppm	20,000	8 MB	8 MB	32 MB	36	●	●	●	●	●	●
●	8 ppm	not rated	8 MB	16 MB	16 MB	35	○	●	\$399	●	●	●
○	8 ppm	20,000	6 MB	6 MB	32 MB	35	○	●	○	●	●	●
○	10 ppm	5,000	2 MB	4 MB	6 MB	35	○	●	○	●	●	●
○	9 ppm	10,000	2 MB	3 MB	10 MB	35	●	●	○	●	●	●
○	9 ppm	18,000	8 MB	8 MB	16 MB	35	●	●	○	●	●	●
○	10 ppm	10,000	2 MB	6 MB	9 MB	35	○	●	○	●	●	●
○	8 ppm	5,000	2 MB	4 MB	4 MB	8	●	●	○	○	●	○
○	9 ppm	5,000	3 MB	10 MB	10 MB	35	●	●	○	●	●	●
●	8 ppm	10,000	6 MB	6 MB	96 MB	35	●	●	\$499	●	●	●
●	8 ppm	10,000	12 MB	12 MB	96 MB	35	●	●	\$499	●	●	●
○	8 ppm	6,000	2 MB	4 MB	4 MB	35	○	●	○	●	●	○
●	8 ppm	10,000	12 MB	20 MB	32 MB	39	●	●	\$895	●	●	●
○	9 ppm	10,000	1.5 MB	3 MB	4.5 MB	17	\$249	\$50	\$663	●	●	○
○	9 ppm	10,000	2.5 MB	4 MB	10.5 MB	35	\$249	\$50	\$663	●	●	●
●	8 ppm	10,000	12 MB	32 MB	64 MB	35	●	●	\$495	●	●	●
●	15 ppm	30,000	4 MB	16 MB	16 MB	35	●	●	○	●	●	●
●	15 ppm	20,000	4 MB	16 MB	16 MB	35	●	●	○	●	●	○
○	17 ppm	75,000	10 MB	10 MB	26 MB	35	○	●	●	●	○	●
○	17 ppm	75,000	8 MB	16 MB	32 MB	39	●	●	\$895	●	●	●
●	20 ppm	100,000	8 MB	8 MB	16 MB	45	●	●	\$895	●	●	●
●	32 ppm	200,000	16 MB	16 MB	16 MB	45	●	●	\$895	●	●	●
●	15 ppm	50,000	4 MB	4 MB	18 MB	35	○	\$229	○	●	●	●
○	17 ppm	50,000	5 MB	5 MB	17 MB	35	○	○	○	●	○	○
○	17 ppm	50,000	8 MB	8 MB	96 MB	35	●	●	●	●	●	●
○	16 ppm	25,000	2.5 MB	4 MB	10.5 MB	35	\$249	\$50	\$663	●	●	●
●	20 ppm	30,000	32 MB	32 MB	32 MB	35	●	●	●	●	●	○

[§]This printer has been discontinued.

[§]Each \$60 package contains two toner cartridges.



Costs: When you're shopping for a printer, finding out the vendor's suggested retail price, or *list price*, is just the beginning. You also need to consider the cost of extra RAM (in our tests, we used enough RAM for complex documents), a Mac-compatible interface (if optional), the cost of toner, and the length of the warranty — hidden factors that add to the long-term cost of your printer. Most vendors sell through dealers that offer substantially discounted *street prices*; we obtained those listed from dealers throughout the U.S. in early June 1993. Others sell direct to you, or through VARs (value-added resellers), which offer little or no discounts.

Table 1: Features of Laser Printers

● = yes
= no

		List price with standard RAM	List price as tested	Street price with standard RAM	Street price as tested	Price of toner cartridge	Pages per toner cartridge	Warranty
Personal Printers								
▶ Apple LaserWriter NTR	■■■½	\$1,179	\$1,179	\$1,050	\$1,050	\$79	4,500	1 year
▶ Digital DEClaser 1152	■■■½	\$1,199	\$1,358	\$1,050	\$1,200	\$79	3,300	1 year*
▶ NewGen TurboPS/660p	■■■½	\$2,195	\$2,195	\$1,875	\$1,875	\$99	3,500	1 year*
Apple LaserWriter Select 310	■■■	\$1,099	\$1,368	\$975	\$1,150	\$89	4,000	1 year
Brother HL-4PS	■■■	\$2,595	\$3,585	\$1,975	\$2,875	\$119	3,500	1 year*
GCC BLP Elite	■■■	\$1,079	\$1,278	\$950	\$1,200	\$33	2,500	1 year*
Hewlett-Packard LaserJet IIIP	■■½	\$1,789	\$2,068	\$1,175	\$1,300	\$95	4,000	1 year
NEC Silentwriter 95fx	■■■	\$1,300	\$1,450	\$1,300	\$1,450	\$239	8,000	1 year*
NewGen TurboPS/880p	■■■	\$2,395	\$2,395	\$2,125	\$2,125	\$99	3,500	1 year*
Star Micronics LS-5TT	■■■	\$1,384	\$1,659	\$1,200	\$1,325	\$95	4,500	2 years
Workgroup Printers								
▶ Apple LaserWriter Pro 600	■■■■	\$2,099	\$2,368	\$1,975	\$1,975	\$149	6,000	1 year
▶ Apple LaserWriter Pro 630	■■■■	\$2,529	\$2,529	\$2,400	\$2,400	\$149	6,000	1 year
▶ GCC SelectPress 600	■■■■	\$4,499	\$4,898	\$3,950	\$4,175	\$33	5,000	1 year
▶ Hewlett-Packard LaserJet 4M	■■■■	\$2,399	\$2,399	\$2,000	\$2,000	\$150	6,000	1 year
Brother HL-10PS	■■■	\$2,395	\$2,714	\$1,600	\$1,825	\$130	4,000	1 year*
Dataproducts LZR 960	■■■½	\$2,195	\$2,420	\$1,600	\$1,800	\$69	3,000	2 years
Dataproducts LZR 965	■■■	\$2,199	\$2,445	\$1,900	\$2,325	\$60	3,000	2 years
Fujitsu Print Partner 10W	■■■	\$2,450	\$2,949	\$1,925	\$2,200	\$230	8,000	1 year
GCC BLP IIS	■■½	\$1,599	\$1,898	\$1,500	\$1,675	\$33	2,500	1 year*
Hardware That Fits RealTech Laser	■■■■	\$1,449	\$2,047	\$1,449	\$2,047	\$59	3,000	2 years*
NewGen TurboPS/440B	■■½	\$3,995	\$3,995	\$3,500	\$3,500	\$179	6,000	1 year*
NewGen TurboPS/660B	■■■½	\$4,995	\$4,995	\$4,025	\$4,025	\$179	6,000	1 year*
Okidata OL-850	■■■	\$1,999	\$2,398	\$1,300	\$1,550	\$33	2,500	1 year†
QMS 860 Print System	■■■■	\$4,595	\$5,394	\$4,250	\$5,000	\$189	6,000	1 year*
Texas Instruments microLaser Plus	■■½	\$1,199	\$1,397	\$1,125	\$1,300	\$42	3,000	1 year
Texas Instruments microLaser Turbo	■■■½	\$1,649	\$1,999	\$1,625	\$1,850	\$42	3,000	1 year
Xante Accel-a-Writer 8100	■■■	\$3,995	\$5,495	\$3,995	\$5,495	\$175	6,000	1 year*
Departmental Printers								
▶ Dataproducts LZR 1560	■■■½	\$3,395	\$4,490	\$3,125	\$4,175	\$349	12,000	2 years*
▶ Hardware That Fits RealTech Laser 400	■■■■	\$3,195	\$4,242	\$3,195	\$4,242	\$329	8,000	1 year
▶ Hewlett-Packard LaserJet 4Si MX	■■■■	\$5,499	\$5,499	\$4,225	\$4,225	\$169	8,000	1 year
▶ QMS 1725 Print System	■■■■	\$5,995	\$6,794	\$5,600	\$6,375	\$179	8,000	2 years*
▶ QMS-PS 2000	■■■■	\$12,995	\$12,995	\$12,995	\$12,995	\$155	20,000	90 days*
▶ QMS-PS 3200	■■■■	\$19,995	\$19,995	\$19,995	\$19,995	\$190	30,000	90 days*
Compaq Pagemarq 15	■■■	\$2,828	\$2,828	\$2,775	\$2,775	\$269	12,000	1 year
Hewlett-Packard LaserJet IIISi [§]	NA	NA	NA	NA	NA	NA	NA	NA
NewGen TurboPS/440N	■■½	\$5,795	\$5,795	\$5,025	\$5,025	\$169	8,000	1 year*
Texas Instruments microLaser XL Turbo	■■■	\$3,699	\$3,848	\$2,850	\$3,075	\$65	6,000	1 year
Varityper 5100E	■■■	\$24,995	\$24,995	\$24,995	\$24,995	\$60 [§]	14,000	90 days*

▶ MacUser Bottom Line pick

* An extended or on-site warranty is available at extra cost.

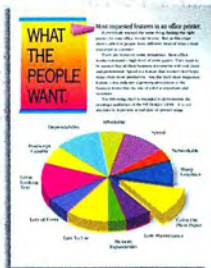
† A 5-year warranty is provided for the print engine's LED array.

Wake up and smell

*Suggested U.S. list price. PostScript is a trademark of Adobe Systems Inc. which may be registered in certain jurisdictions. †In Canada call 1-800-387-3867. © 1993 Hewlett-Packard Company. PE 12313



the future.



The new HP DeskJet 1200C/PS.
\$2,399*

Welcome to the dawning of a new era in office printing. Hewlett-Packard presents the HP DeskJet 1200C/PS. The world's first affordable, networkable, 300-dpi black and color printer with Adobe's PostScript™ Level 2 software built in.

The HP DeskJet 1200C/PS printer has everything Mac users could want. HP's next generation of inkjet technology and built-in PostScript software, for sharp 600 x 300-dpi black and stunning 300-dpi color on plain paper. LocalTalk for easy networking. Memory expandability. And LaserJet PCL 5 compatibility, so it runs any existing LaserJet printer file or font.

Like any good business printer, the DeskJet 1200C/PS is fast. Six pages per minute for black & white. And only one to two minutes per page for color graphics. It comes with 45 scalable fonts, same as the new HP LaserJet 4M, along with 35 Type 1 typefaces.

The future of office printing is here. To see for yourself, call 1-800-552-8500, Ext. 7596 for the name of the HP dealer nearest you.†

DeskJet Printers
Make it happen.



**HEWLETT
PACKARD**



Rating Tech Support:

When you lay out a couple of thousand dollars for a printer, you're also buying access to the vendor's technical expertise. Smart companies know that they need to keep you — the customer — happy, and to do so, they need to answer your questions quickly and accurately.

To give you an idea of what you can expect from the vendors represented in this report, we placed anonymous calls to each one and asked a set of questions. We then assigned each vendor a rating based on the representatives' response time, the answers they provided, and their technical aptitude.

"It's gotta be something simple," he said. Obviously, it wasn't simple enough.

Digital

Digital's tech-support staff eventually answered all of our questions correctly, although it took several time-consuming calls and transfers. The rep handling the second question admitted that he didn't really know the Mac but told our caller to "look for a port with a printer icon on it" — close enough.

Fujitsu

If you hate automated voice-mail, Fujitsu's tech support isn't for you: a recorded voice that drones on about what might be wrong with your printer. We eventually got through to human reps, who answered the first two questions correctly in less than a minute. A third rep, however, could not answer the third question.

GCC

It's a pleasure to have calls handled by reps who are customer-friendly, know their company's products inside out, and are fluent in things Macintosh. GCC's reps answered all of our questions quickly and correctly.

Hardware That Fits

This tech-support staff provides Texas hospitality at its best — the reps are courteous, friendly, and knowledgeable. They answered all of our questions correctly on the first attempts, and we were never left on hold for longer than 1 minute.

Hewlett-Packard

No hand-holding here. "No, sir, I can't!" was the rep's terse reply to our request that he stay on the line while we attempted the fix. HP failed the first attempt to answer the first two questions; the second attempt unearthed friendlier staff and correct answers.

NEC

The first question was answered correctly immediately. On the second question, our caller was left on hold for 15 minutes on the first attempt and 12 minutes on the second, before getting the correct answer. Two reps each failed to answer the third question.

NewGen

NewGen's tech-support staff failed to answer the second question, even after we provided hints such as, "I had to move the printer, and I'm not sure it's set up properly." The first and third questions yielded acceptable results.

Okidata

Pray that your Okidata printer never malfunctions when you're on a deadline. Because of relentless busy signals, our caller needed an average of a dozen tries to get through on each call. When they finally connected, the reps answered the first question correctly, failed the first attempt at answering the second question, and failed to answer the third question altogether.

QMS

Don't expect quick answers from QMS. A rep asks for your name and the nature of your problem and tells you that a technician will return your call the next business day. When no call came, our caller tried again and was told that the technician assigned to his case was out sick and would call back the next day. We eventually got the right answers to the first two questions and the wrong answer to the third question.

Star Micronics

Tech support was not easy to reach, because of repeated busy signals and some unreturned messages. Once we got through, we found that the staff was not Mac-savvy. The rep failed to answer the second and third questions and barely passed answering the first question after our caller gave him a hint.

Texas Instruments

The TI tech-support reps tried to be helpful, but they seemed somewhat baffled that we were having problems with a printer that had printed fewer than 100 pages — not a factor in the second and third questions. Even after much analysis, they answered only the first two questions correctly.

Varityper

You can buy many things for \$40 — good tech support is not among them. Each time you call Varityper's tech-support department, you are charged \$40, regardless of whether your question is answered correctly or at all. It took five calls (\$200), but we eventually got correct answers to all three questions. To be fair, Varityper's reps are more familiar with imagesetters, the core of the company's business.

Xante

Xante's tech-support reps failed to answer the first two questions on the first attempts. Eventually, all the questions were answered correctly, although it took some heavy hinting from our caller.

— Alfred Melo

Key

■ ■ ■ ■ ■	Excellent
■ ■ ■ ■	Good
■ ■ ■	Fair
■ ■	Poor

We asked the following questions:

Q. My printer is printing the pages light on one half and dark on the other.

A. The powdered toner has shifted to one side of the toner cartridge. Remove the cartridge, shake it, and reinstall it.

Q. My printer doesn't show up in the Chooser.

A (LocalTalk printers). Make sure the printer is connected to your Mac's LocalTalk port.

A (EtherTalk-equipped printers). Your Mac is set to a LocalTalk network. Set your Mac to EtherTalk in the Network control panel.

Q. My printer is printing jagged text.

A. Your printer can't find the correct font. Install the desired font in the Extensions or Fonts folder.

Apple

Tech-support staff answered our first question correctly but failed the first attempt at answering the second question and two attempts at the third question. The reps who answered our calls exhibited little technical knowledge.

Brother

One of the worst. We called Brother's tech-support line six times, and each time, the staff member who answered failed to provide the correct answers. Our caller remarked that Brother's customer-service reps lacked technical aptitude and were impatient.

Compaq

Compaq's tech-support reps are knowledgeable, well spoken, and — even when unsuccessful in diagnosing our problems — had a helpful attitude. They answered our first two questions correctly within 15 minutes; the third question stumped them.

Dataproducts

Dataproducts doesn't have a tech-support department; instead, tech-support queries are routed to a product distributor. The distributor's rep answered the first question correctly but was at a loss with the two questions that tested Mac-specific knowledge.



**Resolutions of 800 x 800 dpi and 1,200 x 1,200 dpi are achieved by adding RAM; 960-x-960-dpi resolution is also standard.

The HP DeskJet1200C/PS.




HEWLETT
PACKARD

Laser Printers

part of a document from one tray and the rest from another. This standard feature of LaserWriter Printer Driver 8.0, Apple's new PostScript Level 2 driver (see the "PostScript Reaches a New Level" sidebar), is useful if you print correspondence that has letterhead for the first page and plain paper for the rest. Some printers also offer hardware attachments for specialized tasks such as envelope printing or duplex printing — printing on both sides of the paper, with the pages in correct sequence.

Last, take a moment to consider your likely support needs. Most printer vendors specialize in selling to certain platforms — relatively few vendors can provide equally good support for Mac and PC users. If you have a network with more PCs than Macs, your PC-support needs will likely be greater. If you're a single user or if you're working on an all-Mac network, look for a vendor whose tech support rated well in our testing — the company proved that it understood the problems of Mac

users better than its competitors did (see "Rating Tech Support" in our feature-table foldout in this report).

Make the buying decision easy on yourself: Decide on your price range, your print volume, and the time over which you expect your printer to pay for itself. Next, check out whichever of the following sections — personal printers, workgroup printers, or departmental printers — seems closest to your needs. If you need special paper-handling options or high resolution, narrow the field by using these selection criteria. Then look at the results of our performance tests to find which of the remaining printers is most suitable for the particular types of documents you produce. No matter what your needs, one of these printers will do the job. 

For years, contributing editor Bruce Fraser has been writing for *MacUser* about printers, PostScript, and PostScript printers. Edward O. Griffin, a project leader at ZD Labs, managed the testing for this report.

Which Printer?

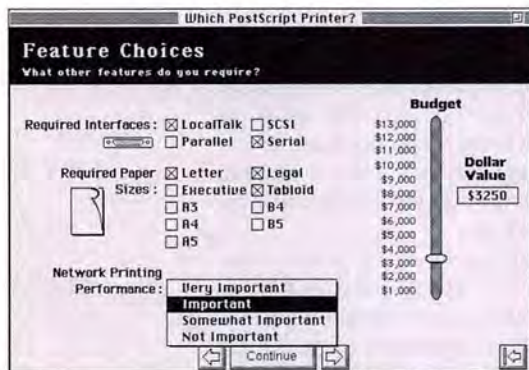
Weighing all the factors involved in choosing a printer can be a complicated and perplexing process. To make the task easier, ZiffNet/Mac, *MacUser's* on-line service, has developed a HyperCard-based expert system called Which Printer Should I Buy?

Based on ZD Labs' speed and output-quality measurements, this interactive buying tool walks you through the decision-making process by asking you about the kinds of documents you print; the interfaces, paper-size options, and other features you need; and your budget. It then recommends the printers most suited for your needs.

Covering all 38 personal, workgroup, and departmental printers evaluated in this issue, Which Printer Should I Buy? not only helps you evaluate these printers but also lets you look up all of their features and specifications.

Which Printer Should I Buy? is available exclusively on ZiffNet/Mac (hosted on CompuServe) and ZiffNet Selections (on AppleLink). ZiffNet/Mac members can download it under the filename WCHPRT.SIT from Library 3 of the MacUser Forum (GO ZMC:MACUSER); AppleLink users can find it in ZiffNet Selections:MacUser Software:Reference.

— Mark Simmons



Directory

Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
800-776-2333
408-996-1010

Brother International Corp.
200 Cottontail Lane
Somerset, NJ 08875
908-356-8880

Compaq Computer Corp.
P.O. Box 692000
Houston, TX 77269
800-345-1518
713-370-0670

Dataproducts Corp.
6219 DeSoto Avenue
Woodland Hills, CA 91365
800-334-3174
818-887-8000

Digital Equipment Corp.
146 Main Street
Maynard, MA 01754
800-344-4825
508-493-7161

Fujitsu Computer Products of America, Inc.
2904 Orchard Parkway
San Jose, CA 95134
800-626-4686
408-432-1300

GCC Technologies, Inc.
209 Burlington Road
Bedford, MA 01730
800-422-7777
617-275-5800

Hardware That Fits
610 S. Frazier
Conroe, TX, 77301
800-364-3487
409-760-2400

Hewlett-Packard Co.
5301 Stevens Creek Blvd.
MS 511L-SJ
Santa Clara, CA 95051
800-752-0900
408-725-8900

NEC Technologies, Inc.
1414 Massachusetts Avenue
Boxborough, MA 01719
800-632-4636
508-264-8000

NewGen Systems Corp.
17580 Newhope Street
Fountain Valley, CA 92708
800-888-1689
714-641-8600

Okidata
532 Fellowship Road
Mount Laurel, NJ 08054
800-654-3282
609-235-2600

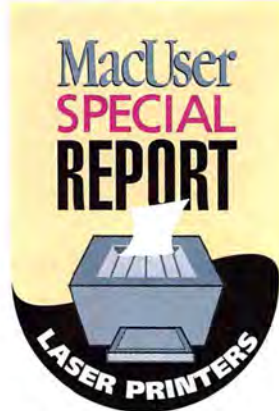
QMS, Inc.
One Magnum Pass
Mobile, AL 36618
800-631-2692
205-639-4400

Star Micronics America
420 Lexington Avenue, #2702
New York City, NY 10130
800-447-4700
212-986-6770

Texas Instruments, Inc.
P.O. Box 202230
Austin, TX 78720
800-527-3500
214-995-2011

Varityper
11 Mt. Pleasant Avenue
East Hanover, NJ 07936
800-631-8134
201-887-8000

Xante Corp.
2559 Emogene Street
Mobile, AL 36606
800-926-8839
205-476-8189



Personal PRINTERS

***If you don't
need blazing
speed or reams
of output,
consider a
PostScript
printer you can
call your own.***

BY BRUCE FRASER

To some people, a personal PostScript printer may seem to be an expensive luxury. But nearly all the personal printers we tested here have street prices of less than \$2,000, and quite a few hover around or are at even less than the \$1,000 mark. At these prices, if you do much printing at all and particularly if you rely on a service bureau or a copy shop for laser printing, you may want to consider getting personal with a PostScript printer.

For those who work with illustration programs such as Adobe Illustrator or Aldus FreeHand, a PostScript printer is a virtual necessity — a screen preview can give you only a rough guide to how your work will turn out. Perhaps you're looking for high resolution. Although most personal printers still provide only 300 dpi (dots per inch), the days when 300 dpi could be considered a standard are fast disappearing. Several of the models we looked at offer higher resolutions or resolution enhancement to improve image quality.

Or perhaps you just want to move up from a dot-matrix or inkjet printer for everyday correspondence. Even the slowest laser printer is much faster than a dot-matrix or inkjet printer, and the appearance of the printed page is far superior. No matter what your reasons may be



for wanting a personal PostScript printer, one of these little guys should fit your needs and your budget.

Letters Galore

If you mostly print straightforward text or word-processing documents, using a printer's built-in fonts, you should give the most weight to our straight-text test (see Figure 3), in which we printed a 50-page Microsoft Word document in 12-point Times Roman. For the most part, the results ranked the printers in order of their engine speed. The NEC Silentwriter 95fx, which has an engine speed of 6 ppm (pages per minute), had the shortest time, followed by the 5-ppm Apple LaserWriter Select 310. We found more variation with the 4-ppm printers. The GCC BLP Elite was the only printer we tested that exceeded its rated 4-ppm engine speed, albeit by a small amount.

The remaining printers each offer some kind of resolution enhancement, which can slow them down. The NewGen TurboPS/660p and TurboPS/880p offer resolutions of 600 and 800 dpi, respectively, so they have more information to process. The Hewlett-Packard LaserJet IIIP offers HP's proprietary RET (Resolution Enhancement Technology), but the results of our other tests indicate that it's simply a slow printer — RET doesn't seem to impose much of a speed penalty.

One printer that didn't rank in order of engine speed was the 300-dpi Star Micronics LS-5TT, which uses the

At a Glance

▶ Apple Personal LaserWriter NTR	★★★½
▶ Digital DEClaser 1152	★★★½
▶ NewGen TurboPS/660p	★★★½
Apple LaserWriter Select 310	★★
Brother HL-4PS	★★
GCC BLP Elite	★★★
Hewlett-Packard LaserJet IIIP	★★½
NEC Silentwriter 95fx	★★★
NewGen TurboPS/880p	★★★
Star Micronics LS-5TT	★★
▶ MacUser Bottom Line pick	

same 5-ppm Fuji-Xerox engine as the Apple LaserWriter Select 310. The LS-5TT uses a resolution-enhancement scheme that works only on its built-in fonts, but as with the LaserJet IIIP, the rest of our testing indicates that it's simply a slow printer.

More Than Words Can Tell

If you print anything other than text that uses a built-in font, engine speed — or at least the small difference among the engine speeds of these printers — isn't a factor. Instead, the efficiency of the printer's connection with your Mac (the speed at which it

accepts data) and the power of the PostScript interpreter (the speed at which it processes data) are paramount.

Our remaining speed tests demonstrated this clearly. The NEC Silentwriter 95fx, for example, dropped well into the middle of the pack, and the Apple LaserWriter Select 310, a PostScript Level 1 printer, finished last or failed to print in three of the four remaining tests. The 5-ppm Select 310 is unique in that, rather than using AppleTalk, it has a direct serial connection with the Mac. This lack of network capability makes it a bit too personal. The venerable Apple Personal LaserWriter NTR, a PostScript Level 2 printer, put in a particularly impressive showing, finishing first in three of these four tests and second in the remaining one.

Font Memories

You may need to print documents that contain several fonts that do not reside in the printer. If so, these fonts must be downloaded (sent from your Mac to the printer), which takes extra time. Our font-download test, printing a single-page Adobe Illustrator document containing 15 downloadable fonts, gives a workout to a printer's processor as well as testing its memory-handling capability. The Apple Personal LaserWriter NTR turned in the best time, followed by the NewGen TurboPS/660p and TurboPS/880p. Considering the extra processing required by the NewGen printers' higher resolutions, this result was impressive. Two printers were notably slower than the others in this test — the HP LaserJet IIIP and the Star Micronics LS-5TT, each of which took almost three times as long as the winner to complete the test. The Star Micronics LS-5TT also produced output that had badly spaced type.

In addition to printing fancy fonts, you may plan to print photographic images. Our gray-scale test involved printing an Adobe Photoshop document containing a 4-x-5-inch 300-dpi gray-scale image and vertical and horizontal gray ramps. The GCC BLP Elite turned in the best time — a little more than 9 minutes — followed by

Trends

During the course of preparing this report, we stumbled across several tantalizing tidbits of information we could not include. Here are some things you should look out for:

- **Street prices below \$1,000 for personal printers.** For slightly more than \$1,000, you can choose from several capable printers right now, and more are on the way. However, expect to see a fresh new crop of PostScript printers costing less than \$1,000 during the next year.
- **New 4-ppm printer from HP.** The \$1,279 Hewlett-Packard LaserJet 4ML is a 4-ppm PostScript Level 2 printer that features 300-dpi resolution and RET. The LaserJet 4ML also features *EconoMode*, a draft-quality mode that prints pages by using 50 percent less toner.
- **New high-resolution personal printers.** The \$1,995 QMS 420 Print System prints 4 ppm at 600 dpi. The printer features QMS' own emulations of PostScript Level 1 and Level 2 in addition to the HP-PCL 4 and HP-GL emulations.
- **One trend we'd like to see discontinued.** The Apple LaserWriter Select 310 is thus far the only PostScript printer that connects to the Mac via a direct serial connection rather than through AppleTalk. Given its lack of networking capability, we hope it remains the only serial PostScript printer for the Mac.

the Apple Personal LaserWriter NTR, the NewGen TurboPS/660p, and the NewGen TurboPS/880p, each of which took a little more than 10 minutes. The Digital DEClaser 1152 and the NEC Silentwriter 95fx took a little less than 12 and 13 minutes, respectively. The rest of the pack was considerably slower. The Apple LaserWriter Select 310 was in a class of its own, taking close to three hours to print the document — and it wouldn't print it at all until we added a \$269 4-megabyte RAM upgrade.

The Power of Process

For a test of raw PostScript-processing power, we used a complex Adobe Illustrator document with processor-intensive elements. The Apple Personal LaserWriter NTR again turned in the best time, taking more than a minute less than its closest competitor, the Brother HL-4PS, which did well because of the brute force of its 40-megahertz Texas Instruments 34010 RISC processor. The NewGen TurboPS/660p was also speedy. The Motorola 68000-based printers — the HP LaserJet IIIP and the

GCC BLP Elite — fared poorly, as we'd expected, but the Star Micronics LS-5TT and the Apple LaserWriter Select 310 were also slow, despite their use of RISC processors.

Our final speed test, printing a QuarkXPress page-layout document containing type, a gray-scale image, and some line art, showed each printer's all-around speed. The Apple Personal LaserWriter NTR once again led the pack, followed by the GCC BLP Elite and the NewGen TurboPS/660p and TurboPS/880p. The Apple LaserWriter Select 310 failed to print.

How They Look

Of course, speed isn't your only consideration when you buy a printer: Output quality is important too. When we subjected pages from these printers to a jury evaluation, the HP LaserJet IIIP, thanks largely to its RET, came out on top (see Figure 1). However, some of the more typographically discerning jury members noticed that RET takes liberties with the outlines of some fonts. The results are pleasing and extremely readable but not

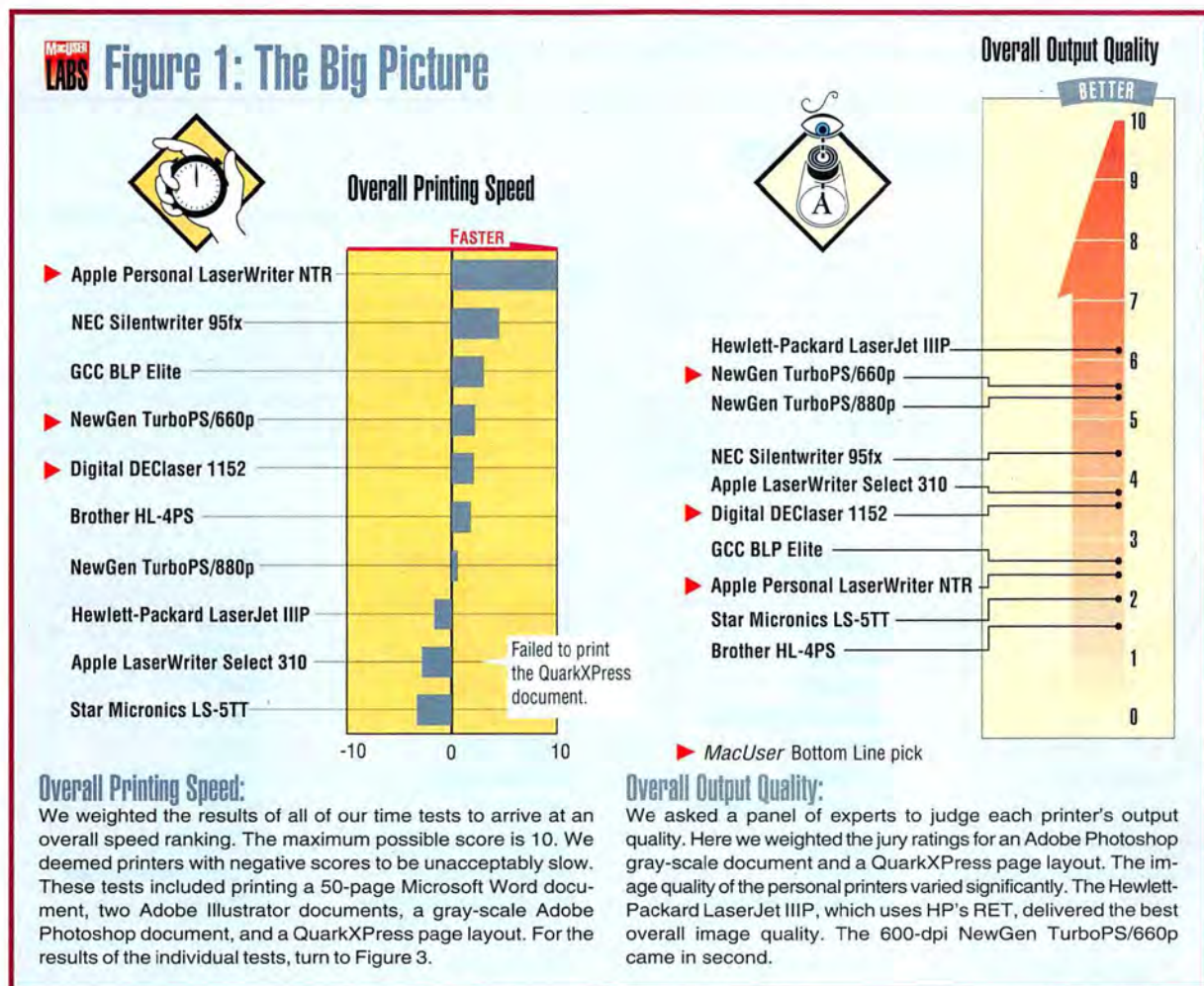
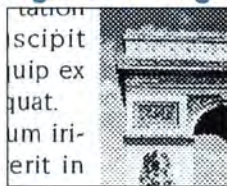
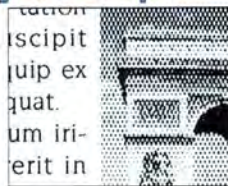


Figure 2: Page-Layout Samples



Best Output:
Hewlett-Packard
LaserJet IIIP



Worst Output:
Star Micronics LS-5TT

necessarily faithful to the intention of the type designer. Second and third places went to the NewGen TurboPS/660p and TurboPS/880p, with their respective 600-dpi and 800-dpi resolutions. Of the unenhanced 300-dpi printers, our jury liked the NEC Silentwriter 95fx the best. The Star Micronics LS-5TT and the Brother HL-4PS were judged to have the worst output quality.

None of the printers presented any particular difficulties

in setup or in replacement of consumables — all came close to the ideal of plug and play. Quadra owners who want to use their machines' built-in EtherTalk must face some disappointment, however: Only the NEC Silentwriter 95fx and the two printers from NewGen offer EtherTalk and then only as a \$499 option — an extra cost that bumps these printers into the price range of the sturdy Apple LaserWriter Pro 630, which includes an EtherTalk port as standard. Likewise, only the NewGen printers have a SCSI port for attaching a font hard drive.


In general, we were impressed by the variety we found in this end of the PostScript market. Although none of these printers stunned us, we found several that could, depending on your work, be a worthwhile addition to your desktop. The major disappointment was the Apple LaserWriter Select 310. It may be the lowest-priced laser printer in Apple's current lineup, but its extraordinarily slow speed for everything except printing straight text, coupled with its mediocre output quality, makes it one of Apple's least attractive offerings ever. For our personal-printer recommendations, see the "Bottom Line" sidebar. For a look at higher-volume workgroup or departmental printers, read on. 



Figure 3: Time After Time

Straight Text:

We used a 50-page Microsoft Word document to measure raw engine speed. The 300-dpi NEC Silentwriter 95fx took top honors, completing the test in approximately 9 minutes. The 800-dpi NewGen TurboPS/880p failed to live up to its name, completing the test in approximately 26 minutes.

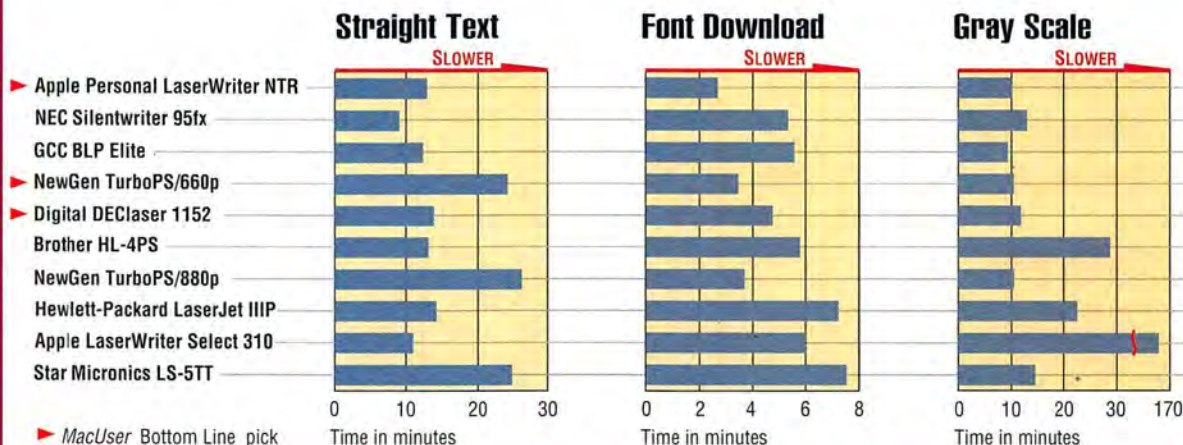
Font Download:

We printed a single-page Adobe Illustrator document containing 15 nonresident Adobe Type 1 fonts to gauge each printer's processor speed and memory-handling ability. The Apple Personal LaserWriter NTR took the least time, completing the test

in approximately 3 minutes. Both NewGen printers also delivered respectable times.

Gray Scale:

To test the gray-scale-printing speed of each printer, we printed a document containing a gray-scale image and vertical and horizontal gray ramps created with Adobe Photoshop. This test taxed each printer's input/output abilities, because a great deal of information had to be downloaded from the Mac. The Apple LaserWriter Select 310 was an outstanding failure here, taking close to three hours to complete the test. The other printers turned in respectable times.



► The Bottom Line

In the computer field, it's rare for an oldie to also be a goodie, but the **Apple Personal LaserWriter NTR** (\$1,179 list, \$1,050 street) is still the best all-around performer in its class. Extremely efficient host/printer communication and a speedy RISC-based PostScript Level 2 RIP make it a fast, flexible performer. Unlike some of the other printers with the same engine, which are limited to a meager 50-sheet capacity, this printer offers an optional 250-sheet paper tray. It also boasts better image quality than most of the other unenhanced 300-dpi printers.

Another low-cost leader is the **Digital DEClaser 1152** (\$1,199 list, \$1,050 street). It didn't excel in any of our speed tests, but it didn't do particularly badly in any of them either, staying consistently in the middle of the pack. It also had the best page-layout output of any of the unenhanced 300-dpi printers.

Finally, for those for whom 300 dpi just doesn't cut it any more, the **NewGen TurboPS/660p** (\$2,195 list, \$1,875 street) offers 600-dpi output at a lower cost than anything else around — at least for the moment. Despite having to process four times as much data as its 300-dpi competitors, it made the top three in all but one of our speed tests. It also has a SCSI port for a font hard drive, which combined with its high-quality output, makes it a good choice for individual desktop publishers on a tight budget.



Top honors go to the **Apple Personal LaserWriter NTR** (above), still the best all-around performer in its class. Although not outstanding, the **Digital DEClaser 1152** (not shown) is a good value for the money. For 600-dpi printing, we recommend the **NewGen TurboPS/660p** (not shown).

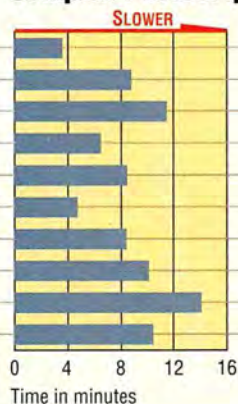
Complex PostScript:

To test each printer's PostScript-processing power, we printed a multilayer line illustration created with Adobe Illustrator. Apple had the best and the worst results, with the Personal LaserWriter NTR and the LaserWriter Select 310, respectively.

Page Layout:

This test used a QuarkXPress document that combined many of the elements in the previous test documents. The Apple Personal LaserWriter NTR performed this task in the shortest time, but the Apple LaserWriter Select 310 failed to print the document at all.

Complex PostScript



Page Layout

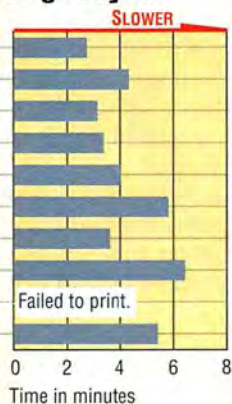
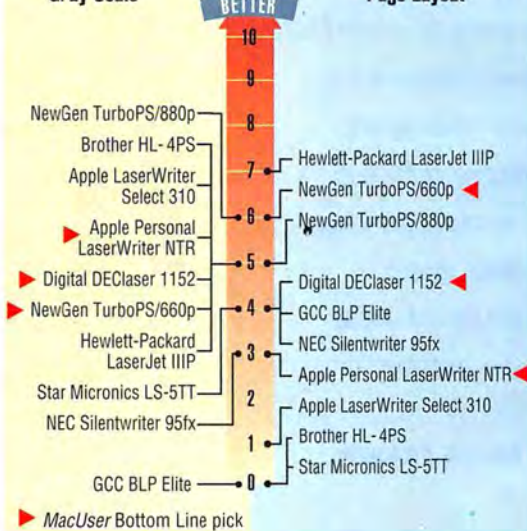


Figure 4: Output Quality

Gray Scale

Page Layout

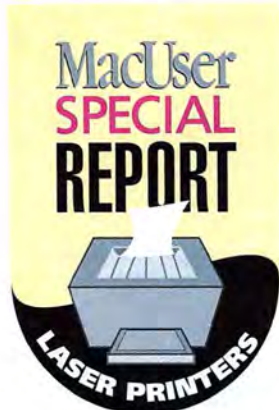


Gray Scale:

To judge halftone output quality, we invited a panel of printer experts to rate a gray-scale Photoshop image and ramps produced by each printer.

Page Layout:

To see how well the printers handled type and line art on page-layout proofs, we subjected QuarkXPress documents from each printer to the same rating process.



WORKGROUP *Printers*

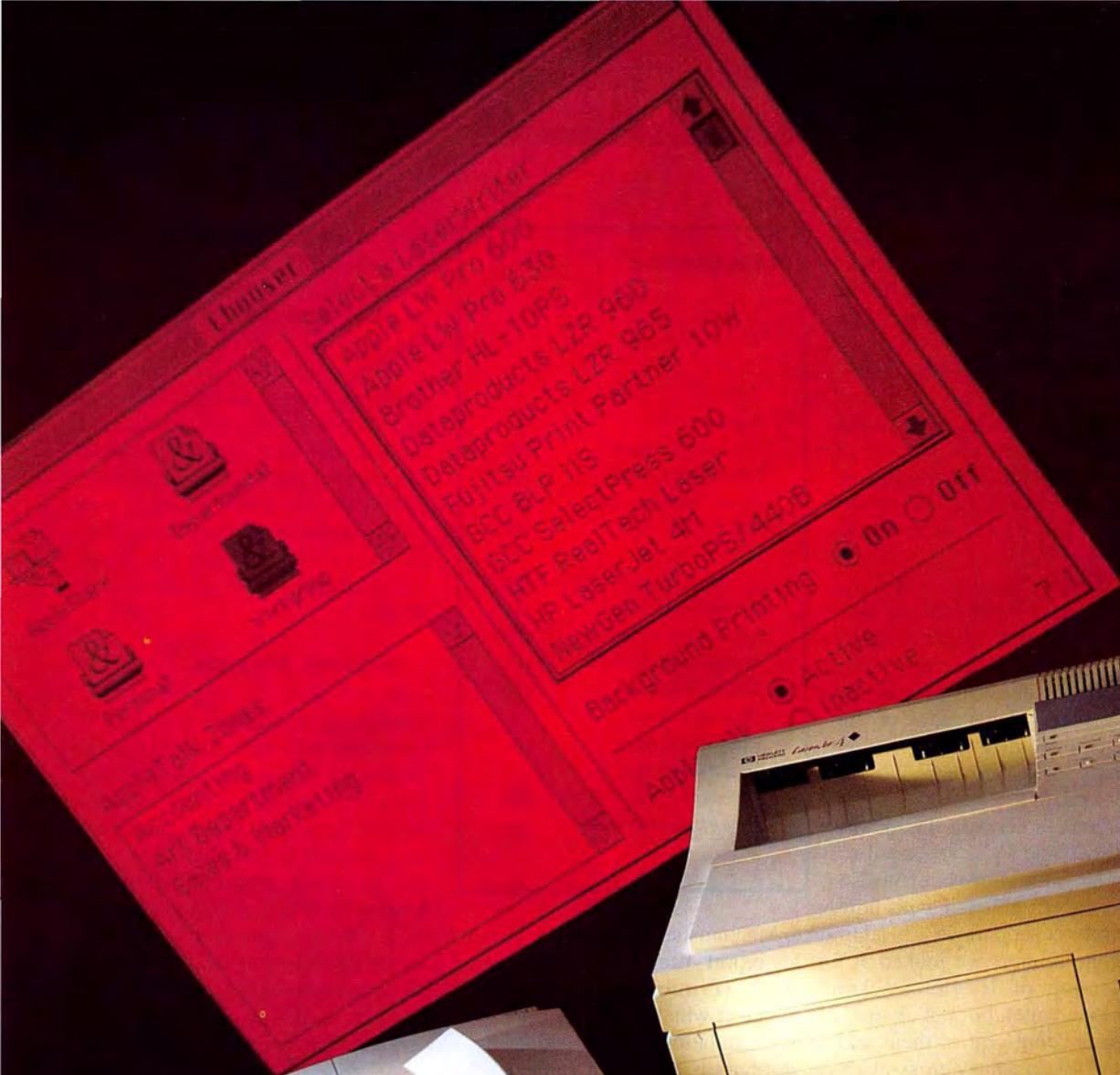
When you and a few of your colleagues create similar documents, you've got yourselves a workgroup. Now get yourselves a printer.

BY BRUCE FRASER

Any PostScript printer that has an AppleTalk port is, in theory, sharable, but some printers are eminently more sharable than others. A shared PostScript printer in a workgroup can be cost-effective or a nightmare bottleneck: Achieving the former and avoiding the latter depends on matching the printer to the type of work you do and to your network configuration.

To help you make an informed decision, *MacUser* and ZD Labs tested 17 printers we judged suitable for small-to-medium workgroups of as many as 30 people. Each has an engine speed of 8 to 10 ppm (pages per minute) and a list price in the range of a little more than \$1,000 to a little less than \$5,000. Five of them can handle paper as large as tabloid-sized, and the remainder use letter and legal sizes.

For an all-Mac network, the choices are fairly simple. You examine the kinds of documents your workgroup produces and look for a printer that has the right combination of engine and processor speed to deliver



consistent throughput. If you have an EtherTalk network, you'll either want to choose a printer with built-in EtherTalk or factor in the cost of an adapter.

You also need to consider paper-handling characteristics. Can the printer hold enough paper to avoid frequent trips to refill the paper tray? Do you need to print from different kinds of paper stock, such as letterhead and plain paper? Is envelope printing important?

Then there's the question of resolution. The days when 300-dpi output was considered the standard are fast disappearing. Some printers incur a speed penalty when printing at higher resolutions, but many of the new generation of 600-dpi printers are actually faster than their 300-dpi predecessors.

If you have a network that mixes Macintoshes and PCs, you need to consider all of the above but you also have to concern yourself with how well the printer supports PCs in addition to Macintoshes. Most of the printers we looked at for this report offer some version of Hewlett-Packard's PCL (Printer Control Language), but not all are able to detect which language is being sent to them and switch emulations automatically. In a busy cross-platform workgroup, automatic emulation switching is an almost essential feature — if you send a PostScript job to a printer that's in PCL-emulation mode, you'll get a printout of the PostScript code, not of the document. Even if you can

rely on users to change the emulation manually to print their own documents, it's a safe bet that they'll forget to switch it back when they've finished.

Some printers can have all interface ports active simultaneously and can automatically switch among emulations and among parallel, LocalTalk, EtherTalk, or serial ports. Others let you configure each port for a specific emulation. Depending on the type of network you have, one solution will suit you better than another.

Surprise, Surprise

In our speed testing of the 17 workgroup printers, we found wide variations that were quite different from what you would expect if you just compared the vendors' specifications for engine speed, processor type, and output resolution. Our first test involved printing a 50-page

Microsoft Word document set in 12-point Times Roman. The conventional wisdom is that engine speed is by far the most important influence on printing speed with documents such as these. This is true up to a point, but our results showed that a fast engine does not alone guarantee fast speed for printing straight text.

The first place in our straight-text speed test was taken by the 10-ppm Brother HL-10PS (see Figure 3), followed by three 9-ppm printers — the Hardware That Fits RealTech Laser, the Texas Instruments microLaser

At a Glance

▶ Apple LaserWriter Pro 600	
▶ Apple LaserWriter Pro 630	
▶ GCC SelectPress 600	
▶ Hewlett-Packard LaserJet 4M	
Brother HL-10PS	
Dataproducts LZR 960	½
Dataproducts LZR 965	
Fujitsu Print Partner 10W	
GCC BLP IIS	½
Hardware That Fits	
RealTech Laser	
NewGen TurboPS/440B	½
NewGen TurboPS/660B	½
Okidata OL-850	
QMS 860 Print System	
Texas Instruments	
microLaser Plus	½
Texas Instruments	
microLaser Turbo	½
Xante Accel-a-Writer 8100	

▶ MacUser Bottom Line pick

Trends

The trend in the midrange-printer market is a move toward more-specialized types of printers. In the past, printers in this class were differentiated primarily by their engines and processor speeds. But some new trends are emerging:

● **Higher resolutions.** The days of the 300-dpi standard are fast disappearing. Until recently, higher resolutions were generally available only on specialized printers that traded high resolution for speed. Now, however, several major laser-printer-engine vendors, including Canon and Fuji-Xerox, are offering true-400-dpi and -600-dpi engines in a variety of speeds and formats.

● **Larger formats.** Until recently, printers capable of handling tabloid-sized pages were expensive specialty items. Now, a slew of printers that can print tabloid-sized pages are available in the \$3,000-to-\$5,000 price range, from Dataproducts, GCC, NewGen, and QMS. We expect this segment of the market to grow rapidly.

● **EtherTalk compatibility.** EtherTalk has generally been available only as an add-on option, if at all. Apple has fueled the move toward EtherTalk by offering it as a standard feature in the Quadra line and in the LaserWriter Pro 630. We expect to see other vendors include EtherTalk as a standard interface in future printers.

● **PostScript Level 2.** Now that Adobe and Apple have released their Level 2 printer drivers, developers can write applications that exploit Level 2 features and ones that the Level 2 driver doesn't address, such as forms caching and pattern caching. Third-party vendors of PostScript-clone interpreters, such as Phoenix Technologies and QMS, have announced or shipped Level 2 versions of their interpreters; other PostScript-clone vendors will undoubtedly follow suit. The result will be faster, more flexible printing with better software control of printer-specific features such as multiple paper trays and switchable resolutions.

Turbo, and the Dataproducts LZR 965 — the latter of which boasts a 600-dpi resolution compared with the others' 300 dpi. Next came the three printers based on the 600-dpi, 8-ppm Canon EX engine: the Hewlett-Packard LaserJet 4M and the Apple LaserWriter Pro 600 and LaserWriter Pro 630. The fastest printer for printing

on tabloid-sized paper, by a considerable margin, was the QMS 860 Print System.

The 10-ppm Fujitsu Print Partner 10W and the 9-ppm Texas Instruments microLaser Plus finished well behind most of the 8-ppm printers. Only three printers trailed them, all higher-resolution tabloid-sized-paper printers

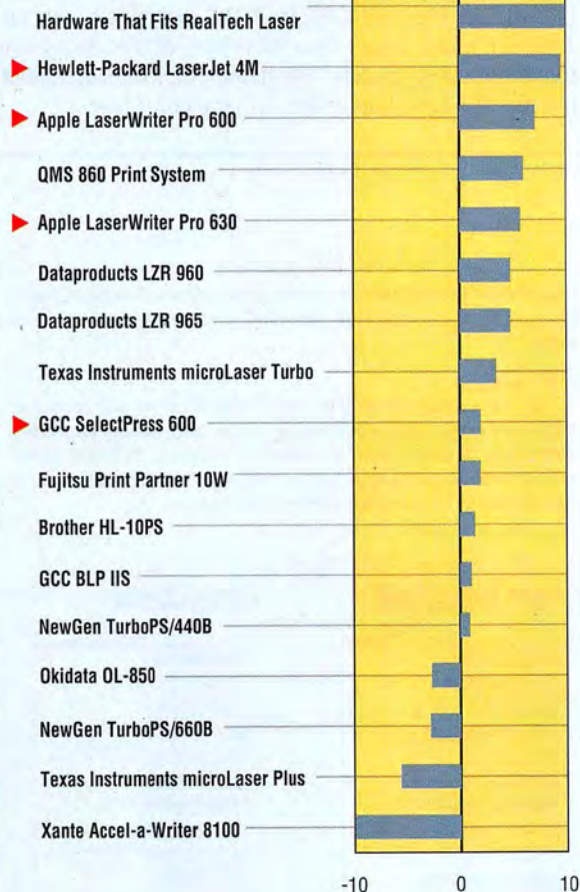


Figure 1: The Big Picture



Overall Printing Speed

FASTER



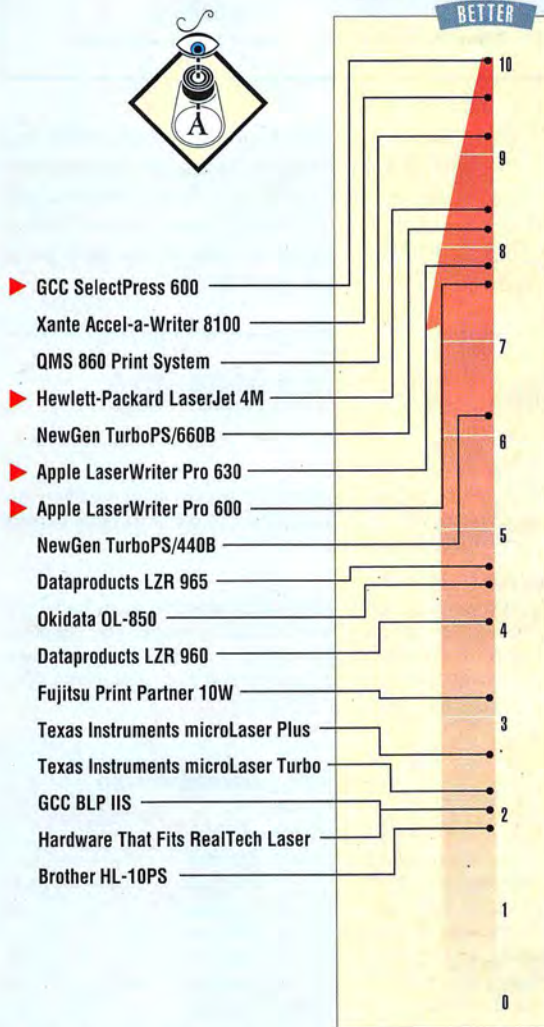
Overall Printing Speed:

We weighted the results of all of our time tests to arrive at an overall speed ranking. The maximum possible score is 10. We deemed printers with negative scores to be unacceptably slow. These tests included printing a 50-page Microsoft Word document, two Adobe Illustrator documents, a gray-scale Adobe Photoshop document, and a QuarkXPress page layout. For the results of the individual tests, turn to Figure 3.



Overall Output Quality

BETTER



► MacUser Bottom Line pick

Overall Output Quality:

We asked a panel of experts to judge each printer's output quality. Here we weighted the jury ratings for an Adobe Photoshop gray-scale document and a QuarkXPress page layout. Image quality varied significantly. The GCC SelectPress 600 had the best overall output quality, and the Brother HL-10PS had the worst.

Figure 2: Page-Layout Samples



Best Output:
GCC SelectPress 600

Worst Output:
HTF RealTech Laser

with 8-ppm engines. The NewGen TurboPS/440B and TurboPS/660B took more than twice as long to complete the test as did the 600-dpi Canon EX-based printers, and the last-place finisher, the 960-dpi Xante Accel-a-Writer 8100, took nearly three times as long as the first-place printer, despite its 8-ppm engine rating.

Fancy Them Fonts

You may have more-complicated printing needs, such as wanting to print documents containing fonts that don't reside on the printer — fonts that must be downloaded from your computer first. Our font-download test consisted of printing a single-page Adobe Illustrator document that contained 15 downloadable Adobe Type 1 fonts — a test of both processor speed and memory-handling ability.

The 600-dpi Apple LaserWriter Pro 600 turned in the best time, followed by the Apple LaserWriter Pro 630 and the Hardware That Fits RealTech Laser. We were surprised that the LaserWriter Pro 630 took slightly longer than the LaserWriter Pro 600: The explanation, according to Apple, is that the Pro 630's automatic port switching incurs some overhead. The Texas Instruments microLaser Plus, the GCC BLP IIS, and the Okidata OL-850 took much longer than the other printers, suggesting that these three printers' 16-megahertz Motorola 68000-based RIPs aren't up to the demands of this test.

Figure 3: Time After Time

Straight Text:

We used a 50-page Microsoft Word document to measure raw engine speed. With a few exceptions, all the workgroup printers turned in respectable times.

Font Download:

We printed a single-page Adobe Illustrator document containing 15 nonresident Adobe Type 1 fonts to gauge each printer's processor speed and memory-handling ability. The Apple LaserWriter Pro 600 and Pro 630 outperformed their competitors. (The

LaserWriter Pro 630 was slower because of its active-ports overhead.) The Hardware That Fits RealTech Laser came in a close third.

Gray Scale:

To test the gray-scale-printing speed of each printer, we printed a document containing a gray-scale image and vertical and horizontal gray ramps created with Adobe Photoshop. This test taxed each printer's input/output abilities, because a great deal of information had to be downloaded from the Mac.

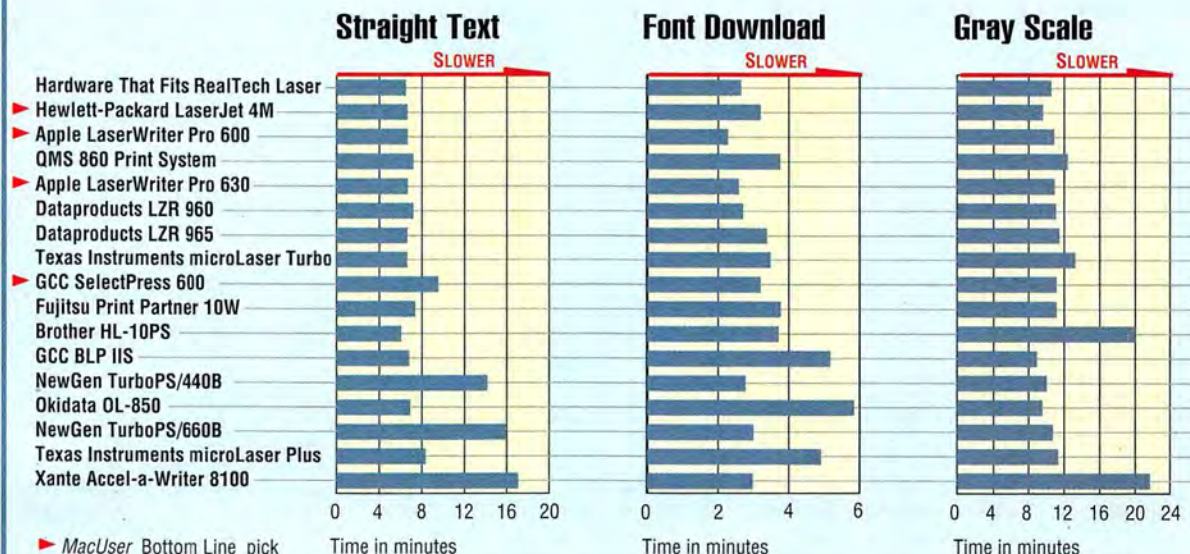


Photo Finish

We also printed an Adobe Photoshop document containing a 4-x-5-inch 300-dpi gray-scale image and vertical and horizontal gray ramps to see how quickly these printers could output photographic images. In this test, the GCC BLP IIS demonstrated that although it may not be up to juggling more than a dozen fonts, it can certainly pull in raw data — in the form of a bit map — through AppleTalk. The BLP IIS took the surprise first place, followed by the Okidata OL-850. The HP LaserJet 4M, the HTF RealTech Laser, and both NewGen printers also turned in respectable times, beating both of the Apple printers.

Two printers — the Brother HL-10PS and the Xante Accel-a-Writer 8100 — were much slower than the rest. The Accel-a-Writer has a lot more work to do than most, because of its 960-dpi resolution, but the 300-dpi Brother HL-10PS has no such excuse.

When we printed the same document at 300 dpi on the higher-resolution printers, most displayed some speed

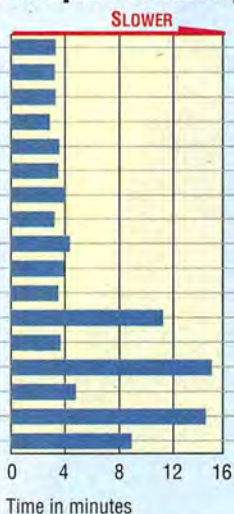
Complex PostScript:

To test each printer's PostScript-processing power, we printed a multilayer line illustration created with Adobe Illustrator. With a few exceptions, all the printers turned in decent print times.

Page Layout:

This test used a QuarkXPress document that combined many of the elements in the previous test documents. The Hewlett-Packard LaserJet 4M and the Hardware That Fits RealTech Laser completed the tests ahead of the rest of the pack.

Complex PostScript



Page Layout

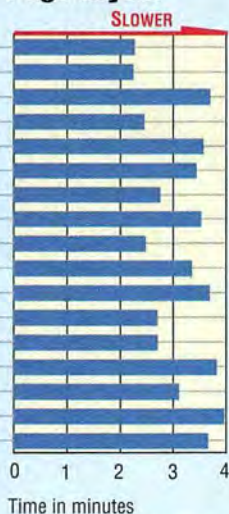
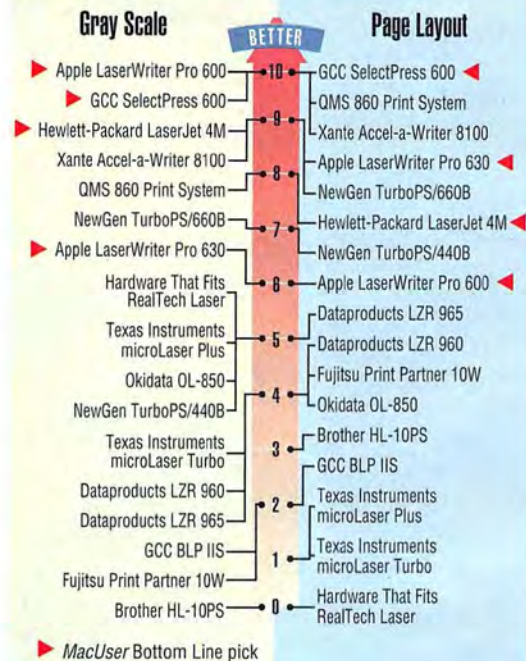


Figure 4: Output Quality



Gray Scale:

To judge halftone output quality, we invited a panel of printer experts to rate a gray-scale Photoshop image and ramps produced by each printer.

Page Layout:

To see how well the printers handled type and line art on page-layout proofs, we subjected QuarkXPress documents from each printer to the same rating process.

increase. The notable exceptions were the Xante Accel-a-Writer 8100, which printed the document more than twice as fast at 300 dpi as at its default 960 dpi, and the QMS 860 Print System and the HP LaserJet 4M, both of which, oddly, were slower at 300 dpi than at 600 dpi.

Four of the printers came to us with an EtherTalk option installed — EtherTalk is standard only on the Apple LaserWriter Pro 630. When we printed the gray-scale page over EtherTalk to the Apple LaserWriter Pro 630, GCC SelectPress 600, NewGen TurboPS/660B, and QMS 860 Print System, each showed a speed gain of close to 40 percent over the speed of printing the same document via LocalTalk, clearly demonstrating the advantage of EtherTalk's wider bandwidth.

Let 'er RIP

We tested the power of the PostScript processor in each printer, first by printing a complex single-page Adobe Illustrator document and then by printing a single-page



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Workgroup Printers

QuarkXPress document containing a gray-scale image, line art, and type in several fonts. The first test is strictly a measure of the printer's PostScript-processing power, whereas the second combines many of the elements of the previous tests and provides a good measure of a printer's all-around capabilities.

Two printers based on the slow Motorola 68000 processor — the Texas Instruments microLaser Plus and the Okidata OL-850 — were much slower than the others in both tests.

The Ol' Switcheroo

In addition to performing our exhaustive suite of speed tests, we sought to verify vendor claims about automatic port switching and emulation switching by queuing up a variety of Mac PostScript, PC PostScript, and PCL print jobs and sending them to the printer as they would be sent in a real-world situation. All the printers met their specifications — only the Brother HL-10PS, HP LaserJet 4M, NewGen TurboPS/440B and TurboPS/660B, QMS 860 Print System, Texas Instruments microLaser Turbo, and Xante Accel-a-Writer were able to switch ports and emulations automatically and the others all required manual intervention to switch emulations through the printer's front panel. The Accel-a-Writer did display one quirk: Unless there was paper loaded in the manual-feed tray, switching from a Mac PostScript to a PCL job produced an irrecoverable paper-out error.

We also tested the printers for TrueType compatibility. The only printer that failed to print our TrueType document was the Fujitsu Print Partner 10W, which uses Microsoft's TrueImage PostScript-compatible interpreter. After discussions with Fujitsu representatives,

we ascertained that although the printer can print TrueType from a PC platform, it can't do so from a Mac in the current version.

Seeing Is Believing

Finally, our jury looked at the printers' output quality (see Figure 1). The high-resolution printers had an obvious advantage here: The all-around winner was the GCC SelectPress 600 (which also has the advantage of edge-to-edge printing), followed by the Xante Accel-a-Writer 8100. The QMS 860 Print System, HP LaserJet 4M, NewGen TurboPS/660B, and both Apple LaserWriter Pros also scored well. In short, the printers that had a resolution of 600 dpi or more scored better than those with lower resolutions. The sole exception was the 600-dpi Dataproducts LZR 965, which actually placed behind one of the lower-resolution printers, the NewGen TurboPS/440B. Of the unenhanced 300-dpi printers, two — the GCC BLP IIS and the Hardware That Fits RealTech Laser — were judged to have poor output quality.

In general, we found greater variety and more options than ever before in printers of this class. Features such as tabloid-sized printing and 600-dpi resolution were once expensive specialties, but now they're decidedly within the mainstream. Older printers such as the GCC BLP IIS, the Texas Instruments microLaser Plus, and the Dataproducts LZR 960 are beginning to show their age, although they can still compete in terms of price and have the benefit of being tried and tested in the real world over a period of years. The overall quality of all these printers is good, but a few stand out from the pack. You'll find the details in the "Bottom Line" sidebar. ☞

► The Bottom Line

If you've decided to purchase a workgroup laser printer, we recommend one of the following, depending on your situation. For letter-sized output, the obvious choices for an all-Mac workgroup are the **Apple LaserWriter Pro 600** (\$2,099 list, \$1,975 street) and the **Apple LaserWriter Pro 630** (\$2,529 list, \$2,400 street). If you need EtherTalk or a SCSI port for a font-caching hard drive, get the Pro 630. If you don't, adding RAM to the Pro 600 makes it functionally equivalent to the Pro 630 — including the ability to use PhotoGrade, which improves halftone images, and FinePrint, which sharpens type and line art.

For a cross-platform network, the **Hewlett-Packard LaserJet 4M** (\$2,399 list, \$2,000 street) may be a better choice, by virtue of its automatic emulation switching. Its main drawback is

that it lacks both built-in EtherTalk and a SCSI port for a printer hard drive.

For tabloid-sized output, the **GCC SelectPress 600** (\$4,499 list, \$3,950

street) performed well. The GCC printer lacks automatic emulation switching, making it more suitable for Macintosh-only networks.



Top honors go to the **Apple LaserWriter Pro 630** (top left) and **Pro 600** (bottom left) and the **Hewlett-Packard LaserJet 4M** (top right). For printing tabloid-sized output, we liked the **GCC SelectPress 600** (bottom right).

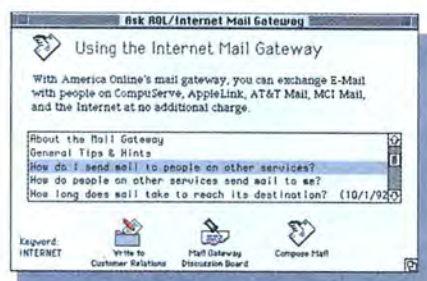
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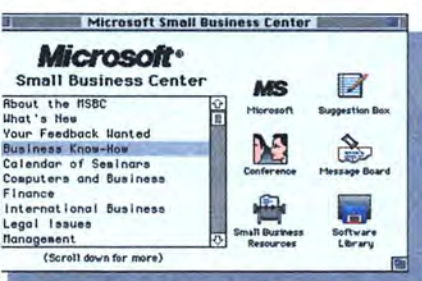
Graphic Windowing Interface



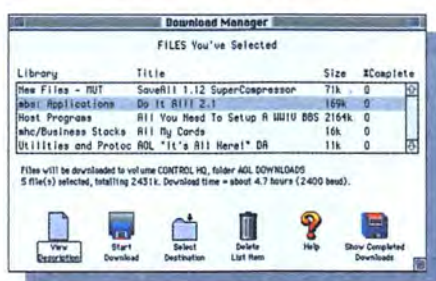
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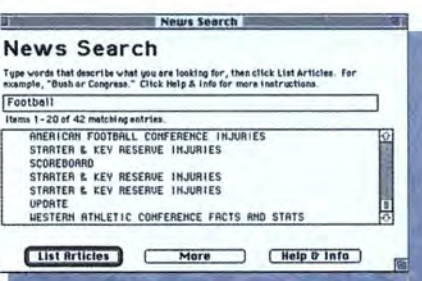
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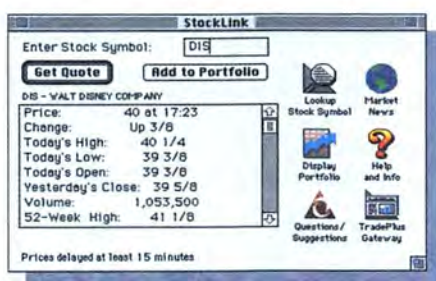
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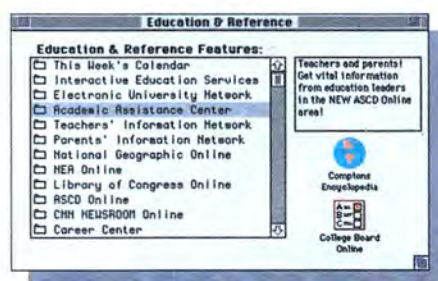
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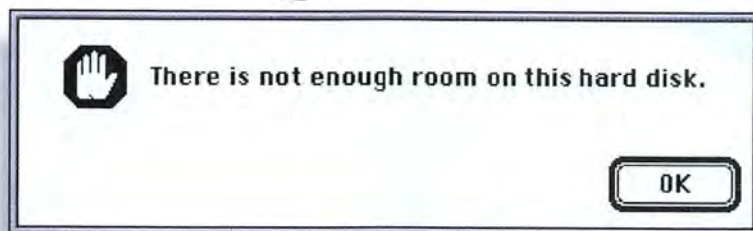



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Departmental **PRINTERS**

***Equip an
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BY BRUCE FRASER

If you need one laser printer that does it all, to be shared by a large group of busy paper pushers, you need a departmental printer. Departmental printers have fast engines that let them pump out pages of text and fast PostScript interpreters that let them crunch their way through complex graphics without slowing down. An EtherTalk interface is almost essential; LocalTalk is simply too slow to handle the volume of traffic. But speed isn't all you need.

Departmental printers also need to be robust enough to handle the volume of work thrown at them, which means a heavy monthly duty cycle, and they need high-capacity paper trays so that they can operate unattended. Switching among interface ports and among printer emulations is automatic on most of these printers, which also aids unattended operation. A few offer advanced paper-handling options such as automatic duplex printing — printing on both sides of the paper — or auto-collation of print jobs into multiple output trays.

Using a departmental printer isn't always the best solution. If, for example, you have a small art department that typically produces complex graphics, it may make more sense to provide it with a dedicated workgroup printer rather than let a RIP-choking FreeHand or Illustrator file bring printing to a halt for the entire office. But if the work is



Departmental Printers

relatively homogeneous, a departmental printer has some obvious advantages. You can standardize on one set of consumables and enter into a single service contract.

We looked at 11 such printers, ranging from medium-duty models priced at around \$3,000 to heavy-duty printers capable of printing as many as 200,000 pages per month, with five-figure price tags to match. Overall, we were impressed by the quality of these printers, but four in particular stood out in our speed tests: the QMS-PS 3200, QMS-PS 2000, Hewlett-Packard LaserJet 4Si MX, and QMS 1725 Print System (see Figure 1).

Text and More Text

As with the other classes of printers, we started our evaluation with the basics. Our first test, printing a 50-page Microsoft Word document set in 12-point Times Roman, was largely a measure of engine speed.

The QMS-PS 3200 was the clear winner, by virtue of its 32-ppm Ricoh engine, followed by the 20-ppm QMS-PS 2000 (see Figure 3). In general, the printers ranked

At a Glance

▶ Dataproducts LZR 1560	
▶ Hardware That Fits	
RealTech Laser 400	
▶ Hewlett-Packard LaserJet 4Si MX	
▶ QMS 1725 Print System	
▶ QMS-PS 2000	
▶ QMS-PS 3200	
Compaq Pagemarq 15	
Hewlett-Packard LaserJet IIIiSi*	NA
NewGen TurboPS/440N	
Texas Instruments microLaser XL Turbo	
Varityper 5100E	

*This printer has been discontinued.

▶ MacUser Bottom Line pick

according to engine speed, but two printers took much longer than we expected: The 17-ppm NewGen TurboPS/440N took almost twice as long as the other 17-ppm printers, and the 20-ppm Varityper 5100E turned in the longest time of all, taking almost twice as long as the other 20-ppm printer, the QMS-PS 2000.

If you and your cohorts prefer esoteric fonts, you'll be interested in the results of our font-download test, which tests the printer's processor speed as well as its memory-handling capabilities. The first three places went to the three QMS printers. The two slowest, the Texas Instruments microLaser XL Turbo and the Compaq Pagemarq 15, each suffered from having only 4 megabytes of RAM, which meant they had to do

much more juggling to switch fonts in and out of memory.

Fast Photos?

Our gray-scale test really taxed the host/printer connection: Printing large images involves sending huge amounts of data to the printer. In this test, the NewGen

Trends

Vendors now realize that it takes more than a fast engine and large paper trays to make a departmental printer. Two vendors in particular — QMS and Dataproducts — are aggressively pursuing the departmental-printer market. QMS has incorporated its Crown architecture into many of its printers, and Dataproducts is expanding printing options with VPT (Virtual Printer Technology).

Crown

One of the most useful new features in QMS' Crown architecture is *compile-ahead technology*. The printing process comprises three phases: compiling the incoming data, rasterizing it into a bit map at the printer's resolution, and printing the bit map on the paper. The Crown architecture separates the compiling and rasterizing phases, storing the results of the compilation in an intermediate display list that can be rasterized quickly. This approach has the following benefits:

- **Fast printing of collated jobs.** Because each page has already been compiled, it is rasterized quickly at the appropriate point in the print job, providing fast collated output.
- **Efficient use of the printer engine.** In most printers, the engine cycles down between jobs and it takes time for the fuser element to heat up and for the moving parts to attain their correct speed.
- **Better throughput.** If the print engine is busy, the printer can still work on compiling and rasterizing incoming print jobs, storing them until the engine is free.
- **Better error recovery.** If a paper jam occurs, the pages are still available in display-list format. Once the paper jam has

been cleared, there's no need to resend the file.

QMS has already implemented the Crown architecture in many of its printers, including the three evaluated in this report, but its new 4525 Print System ventures into an area that was previously the exclusive domain of machines with six-figure price tags. This 45-ppm printer features a 2,200-sheet paper capacity, duplex printing as standard, and the option of feeding print jobs into 20- or 40-slot mail bins or into a stapler/stacker that can collate and staple as many as 35 pages at a time.

VPT

Dataproducts is taking a different route with VPT in its new LZR 1580 and LZR 2080 printers. Instead of connecting to a network by using multiple connections through different ports, the LZR 1580 and 2080 use a single Ethernet connection. A board lets each printer appear to be as many as 64 devices on the network, each one configured for a specific network protocol and page-description language. This scheme allows network administrators to set up printer configurations for different users. The users then simply select the appropriate virtual printer instead of worrying about selecting the correct page-description language or choosing the right paper tray. Access to each virtual printer can be controlled, so that the users see only the printers for which they have access privileges.

The first VPT-based printers allow context switching, so that downloaded resources such as fonts are preserved when the printer switches emulations. Future printers will also support account tracking for each virtual printer, allowing network administrators to keep track of printer use.

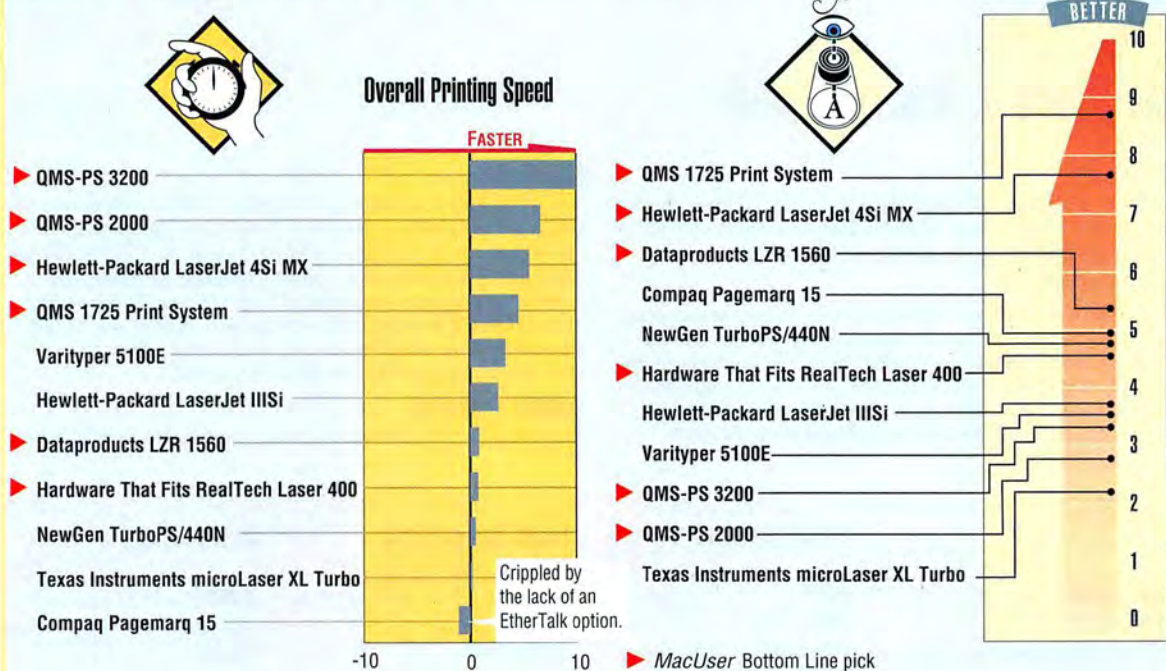
TurboPS/440N finished first, followed closely by the HP LaserJet 4Si MX and the Varityper 5100E. All three printers use fixed-sized input buffers to handle the incoming data stream. Next came the QMS-PS 3200, QMS-PS 2000, HP LaserJet IIISi, and QMS 1725 Print System. The QMS printers use input buffers too, but unlike those of the other printers, the QMS buffers are user-configurable via software. It's possible that better performance could be attained with these printers if the buffers were configured for gray-scale printing. The Compaq Pagemarq 15 was remarkably slow on this test, taking almost twice as long as its closest competitor, the Hardware That Fits RealTech Laser 400. Some of its sluggishness could be ascribed to a shortage of RAM, but the Texas Instruments microLaser XL Turbo, which also had only 4 megabytes of RAM, finished the test in half the time the Compaq took.

Not Created Equal

To test the PostScript-processing power of each printer, we printed a complex single-page Adobe Illustrator document containing processor-intensive elements such as blends and clipping paths. The first four places were taken by the QMS-PS 3200, QMS-PS 2000, HP LaserJet 4Si MX, and QMS 1725 Print System. The NewGen TurboPS/440N, the HP LaserJet IIISi, and the Compaq Pagemarq 15 were surprisingly slow, considering that each has a RISC-based processor.

Our final test was printing a composite page-layout document containing line art, a gray-scale image, and type, providing a good picture of all-around printer speed. The QMS-PS 2000 took first place, followed almost neck and neck by the HP LaserJet 4Si MX, the QMS-PS 3200, and the Varityper 5100E. The two slowest — the Compaq Pagemarq 15 and the Texas Instruments

MacUser LABS Figure 1: The Big Picture



Overall Printing Speed:

We weighted the results of all of our time tests to arrive at an overall speed ranking. The maximum possible score is 10. We deemed printers with negative scores to be unacceptably slow. These tests included printing a 50-page Microsoft Word document, two Adobe Illustrator documents, a gray-scale Adobe Photoshop document, and a QuarkXPress page layout. For the results of the individual tests, turn to Figure 3.

Overall Output Quality:

We asked a panel of experts to judge each printer's output quality. Here we weighted the jury ratings for an Adobe Photoshop gray-scale document and a QuarkXPress page layout. The QMS 1725 Print System produced the best overall image quality, and the Hewlett-Packard LaserJet 4Si MX gave above-average image quality.

Figure 2: Page-Layout Samples



Best Output:
Hewlett-Packard
LaserJet 4Si MX



Worst Output:
Texas Instruments
microLaser XL Turbo

microLaser XL Turbo — had identical times, taking more than twice as long as the first four printers to complete the test.

Fast Talking?

We printed the gray-scale document again to see how much of a speed penalty would be incurred by using LocalTalk instead of the Ethernet connection. Speed

suffered considerably on all the printers: The least affected were the QMS-PS 2000, which slowed down by 61 percent, and the NewGen TurboPS/440N, which displayed a 67-percent slowdown. The most affected were the QMS-PS 3200, which slowed down by 75 percent, and the QMS 1725 Print System, which slowed down to almost half of its speed when connected to an Ethernet network. A similar test, using our font-download document, produced a similar pattern of results.

When you're printing drafts of documents, consider running a high-resolution printer at a lower resolution in order to get faster output. Five of the higher-resolution printers we tested can print at 300 dpi in addition to their higher default resolutions. We printed the gray-scale document at 300 dpi on those printers to see if there was a speed difference. The difference was barely measurable with the QMS 1725 Print System and the HP LaserJet 4Si MX and was less than 5 percent with the HTF RealTech Laser 400 and the Dataproducts LZR 1560. But the Compaq Pagemarq 15 showed a 47-percent speed gain at 300 dpi, compared with its default 800-x-400-dpi resolution. Clearly the Pagemarq 15's higher



Figure 3: Time After Time

Straight Text:

We used a 50-page Microsoft Word document to measure raw engine speed. The 32-ppm QMS-PS 3200 outpaced the competition, closely followed by the 20-ppm QMS-PS 2000.

Font Download:

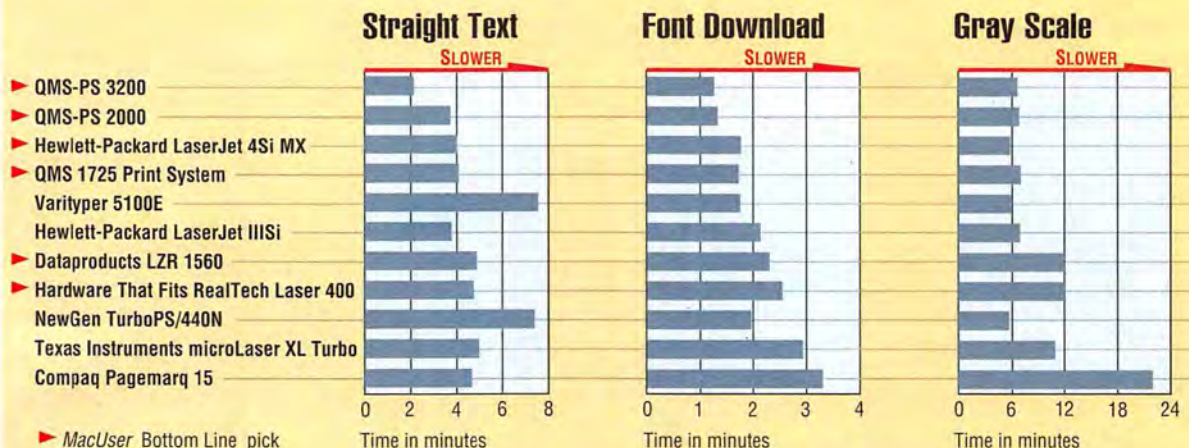
We printed a single-page Adobe Illustrator document containing 15 nonresident Adobe Type 1 fonts to gauge each printer's processor speed and memory-handling ability. The Varityper 5100E — more imagesetter than network printer — performed better in this test than in the previous one, because of its 40-megahertz LSI Logic microprocessor and 32 megabytes of standard RAM.

Gray Scale:

To test the gray-scale-printing speed of each printer, we printed a document containing a gray-scale image and vertical and horizontal gray ramps created with Adobe Photoshop. This test taxed each printer's input/output abilities, because a great deal of information had to be downloaded from the Mac. The NewGen TurboPS/440N showed good input/output abilities, as did the Hewlett-Packard LaserJet 4Si MX. The Compaq Pagemarq 15 was crippled by the lack of an EtherTalk option.

Complex PostScript:

To test each printer's PostScript-processing power, we printed a



resolution carries a lot of overhead, which may contribute to its generally sluggish speed in our other tests.

Making the Switch

All these departmental printers feature the ability to switch among interface ports on the fly, and most also have automatic emulation switching. We connected Macs via LocalTalk and PCs via a parallel port and then queued up a sequence of print jobs that used Mac PostScript, PC PostScript, and PCL.

The HTF RealTech Laser 400 and the Dataproducts LZR 1560 must be switched manually between PCL and PostScript — a real inconvenience in a shared printer — and the Varityper 5100E is strictly a PostScript printer, offering no other emulations. All the remaining multiport printers were able to switch automatically among the different interfaces and emulation modes.

Image Makers

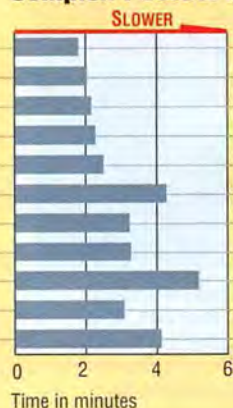
Of course, a speedy printer that turns out unreadable text or messy images isn't much use. When we evaluated image quality, we found that, as expected, the

multilayer line illustration created with Adobe Illustrator. The most impressive performers in this test were the QMS-PS 2000 and 3200.

Page Layout:

This test used a QuarkXPress document that combined many of the elements in the previous test documents. The QMS-PS 2000 was the winner in this test, followed closely by the Hewlett-Packard LaserJet 4Si MX. Although the 300-dpi Texas Instruments microLaser XL Turbo had to process less information than did the Compaq Pagemark 15, it could do no better than tie for last place.

Complex PostScript



Page Layout

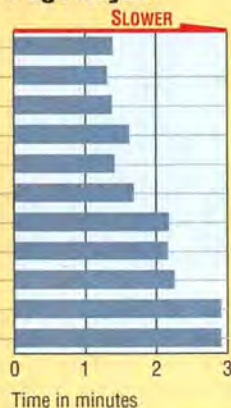
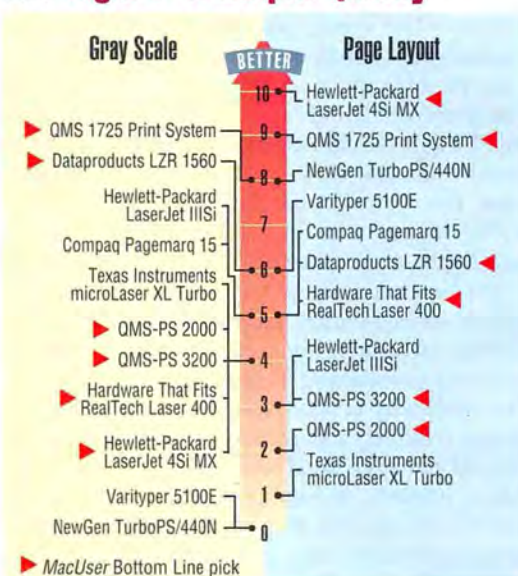


Figure 4: Output Quality



Gray Scale:

To judge halftone output quality, we invited a panel of printer experts to rate a gray-scale Photoshop image and ramps produced by each printer.

Page Layout:

To see how well the printers handled type and line art on page-layout proofs, we subjected QuarkXPress documents from each printer to the same rating process.

higher-resolution printers had the advantage. Our jury preferred the 600-dpi output of the QMS 1725 Print System and the HP LaserJet 4Si MX to that of all the other contenders. The QMS 1725 Print System produced the best halftones, and the LaserJet 4Si MX's RET helped it produce the best type (see Figure 4).

The 600-dpi Varityper 5100E did well for type and line-art quality, but poor halftones pushed its overall image-quality score below that of all the other printers. A Varityper representative, however, claims that the light, flat quality of the images our jury judged as poor halftones is, in fact, intentional. The printing engine in the Varityper 5100E was originally designed to print camera-ready output, used to create plates for printing rather than final output for day-to-day use. Each dot is made smaller than those created by other printers, so that when the resulting image is used to make a printing plate, the inevitable expansion in dot size, called *dot gain*, will not muddy the printed image.

Among the 400-dpi printers, the Dataproducts LZR 1560 was judged to have the best halftones and the NewGen TurboPS/440N produced the best type and line art. Of the unenhanced 300-dpi printers, the QMS-PS 3200 produced the best-quality page-layout documents.

Departmental Printers

In terms of overall results, the printers fall into several broad categories. The QMS-PS 2000 and QMS-PS 3200 are heavy-duty workhorses that can print at tabloid size and feature fast speed, high monthly duty cycles, and advanced paper-handling options such as duplexing — but at a premium price.


The Varityper 5100E is something of an oddity. It's driven by an external Adobe Emerald RIP, and its lack of emulations and slow speed in printing straight text suggest that it would be best suited as a plain-paper proofing device for an imagesetter, which could also be driven by the same Emerald RIP. It performed well on our graphics-intensive tests, suggesting that it's best suited to service-bureau and prepress-house use. As a departmental printer, it leaves something to be desired, particularly considering its high price.

The remaining printers that can handle tabloid-sized paper are relatively inexpensive. The Dataproducts LZR 1560 and the HTF RealTech Laser 400 are basically identical printers, and either would be a good choice where a medium-duty printer with tabloid capability is required and where auto-emulation switching isn't an issue. The Compaq Pagemarq 15 is based on the same 15-ppm engine but with resolution boosted to 800 x 400 dpi. According to the scores awarded by our image-quality jury, however, the resolution enhancement doesn't

result in a significant improvement in the appearance of the printed page, and it causes a significant slowdown.

For letter-sized output, the QMS 1725 Print System and the HP LaserJet 4Si MX ran almost neck and neck throughout the testing. The QMS 1725 Print System is somewhat more full-featured: It has an internal hard drive that can be used for print buffering as well as for font storage, which allows it to accept multiple print jobs simultaneously through different ports; it also has a SCSI port for attaching an external hard drive. The LaserJet 4Si MX has no provision for a hard drive, but it's a little less expensive than the QMS printer. Both offer an optional duplexing attachment.

The NewGen TurboPS/440N comes in at more or less the same price as the LaserJet 4Si MX and the 1725 Print System, but it's substantially slower for most tasks and has lower-resolution output. The Texas Instruments microLaser XL Turbo is one of the least expensive of all the printers evaluated here, and although it turned in relatively unspectacular results in terms of both speed and image quality, it offers basic necessities such as an EtherTalk option and automatic emulation and port switching at a competitive price.

No single printer is ideal for everyone. Each has its uses, but a few seemed to be outstanding in their class. For our top picks, see the "Bottom Line" sidebar. 

► The Bottom Line

For those who need to equip a department with a heavy-duty behemoth of a printer, the **QMS-PS 3200** (\$19,995 direct) and the **QMS-PS 2000** (\$12,995 direct) are likely contenders. The main difference between the two is in their monthly duty cycles — 200,000 for the QMS-PS 3200 and 100,000 for the QMS-PS 2000 — and in their prices. Each handles paper as large as tabloid size, and each has a duplexing option.

For those whose print volume is a bit lower and who don't need tabloid-sized output, the **QMS 1725 Print System** (\$5,995 list, \$5,600 street) and the **Hewlett-Packard LaserJet 4Si MX** (\$5,499 list, \$4,225 street) each offer fast speed and excellent image quality at a reasonable price. The LaserJet 4Si MX was the faster of the two by a hair's breadth in our tests, but the 1725 Print System has several important features, such as a SCSI port and an internal hard drive that lets it spool incoming print jobs simultaneously over different ports, that the LaserJet 4Si MX lacks.

Finally, for those who need tabloid-sized output and can live without automatic emulation switching, the **Hardware That Fits RealTech Laser 400** (\$3,195

direct) and the **Dataproducts LZR 1560** (\$3,395 list, \$3,125 street) are cost-effective. HTF provided outstanding tech support, which might be a reason to

choose its printer over the LZR 1560 — in almost all respects, the RealTech Laser 400 and the Dataproducts LZR 1560 are identical printers.



The QMS-PS 3200 (rear) and the QMS-PS 2000 (middle left) are strong heavy-duty printers. For lower volumes, we recommend the QMS 1725 Print System (front left) and the Hewlett-Packard LaserJet 4Si MX (middle center). The Hardware That Fits RealTech Laser 400 (middle right) and the Dataproducts LZR 1560 (front right) are good for tabloid-sized output.

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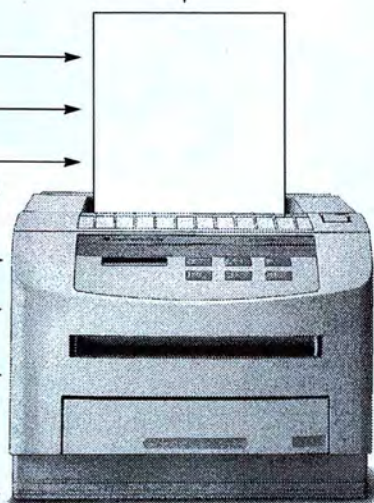
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BY SHARON ZARDETTO AKER

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- **You need a dedicated application in one category and a bit of everything else.** If you use Excel, for instance, because of its advanced capabilities, don't avoid an integrated package just because it has a spreadsheet module you don't need. You'll get all the other modules for less than the cost of buying separate applications.

- **The dedicated program you'll eventually need doesn't fit in your budget now.** An integrated package is a cost-effective way to get started, as long as it takes care of the basics in the area that concerns you the most. You'll be able to input information that can be transferred later to the major program of your choice, and you will still have the other modules' capabilities at your fingertips.

So, it's relatively easy to decide whether or not you should get an integrated package. If you decide this all-in-one approach is for

you, the issue becomes *which* package to buy. We first compared the four "Works" packages in terms of their basic components (word-processing, database, spreadsheet, graphics, and telecommunications) and then considered two other important factors: how well the Works packages work with dedicated applications and how well they integrate their parts. We think you'll find that picking the best package isn't too difficult.

Word Processing: The Basics

Although there's a definite winner — and a clear loser — when you compare the word-processing modules of the four packages, any one of them could fulfill the basic word-processing needs of many users. They all offer the basics and include multiple-line headers and footers, a spelling checker, a thesaurus, basic find and replace functions (although none lets you search by character styles), the capability to copy ruler settings from one paragraph to another, and direct-merge capability with the package's database module for form letters.

Microsoft Works makes the poorest showing of the group. You can't define multiple character formats under a single name (Helvetica 14 for roman, bold, italic, *and* underline, for instance), a capability you find in each of the other packages. Its simple macro function doesn't make up for this, because you can never be sure if the macro will toggle a style on or off. The program has the fewest options for paragraph and character formatting, and there's no multiple-column capability except as part of the draw layer, where your formatting options are almost nonexistent.

WordPerfect Works has a slight edge over GreatWorks, but not by much. Neither has footnote capability, and GreatWorks is missing a word-count function and a way to define paragraph formats. GreatWorks includes an outliner, but it's a separate module with no links to the word processor. WordPerfect Works is the only word processor in this group that lets you define paragraph formats (see Figure 1). It's also the only one that lets you create sections in a document that can have different headers, footers, column formats, and page numbering. But its column capabilities are limited to equal widths, unlike ClarisWorks' and GreatWorks', which allow variable-width columns on a page.

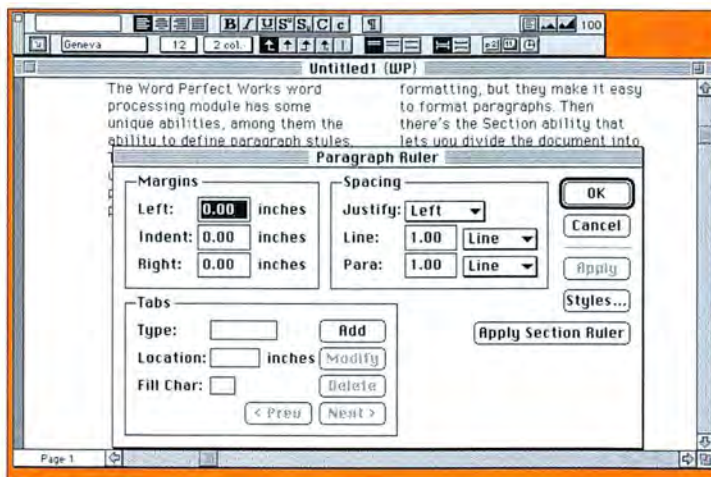


Figure 1: WordPerfect Works is the weakest of the integrated packages, but it does have a full-featured word processor that provides a complete range of paragraph formatting, including defined paragraph formats.

The ClarisWorks word processor doesn't have the sections and paragraph definitions that WordPerfect Works provides, but it has an integral outlining function and a more elegant interface, including a floating palette of shortcut icons. Overall, it's the best of the bunch.

Database Modules: FileMaker Light?

When it comes to the database module, ClarisWorks is again on the top of the heap, but this time WordPerfect Works vies with Microsoft Works to stay out of the bottom spot.

Although the Microsoft Works database module is more polished than the one in WordPerfect Works, they both have significant drawbacks. For example, you enter data through a formula bar (as in a spreadsheet program) instead of directly into a field. Whether you're using the entire file or a selected subset, there's never any indication of how many records you're working with. Layout options are minimal, without even grids or rulers for alignment of objects. Sorting is available on only a single criterion; for a multilevel sort, you have to do a series of single sorts. The report options are dismal: Design options are limited, and the only functions are totals and subtotals.

The database module in GreatWorks is a vast improvement over Microsoft Works on every level (see Figure 2). Modeled after early versions of FileMaker Pro, it's easy to set up and has a variety of tools and options in the Design mode. You can format fields to have a unique value, a serial number, or an incrementing number. A floating palette indicates the number of records you're working with and lets you move easily from one record to another. The report functions include total, average, count, minimum, and maximum.

But the ClarisWorks database module, which looks like a subset of FileMaker Pro, leaves even GreatWorks' database module in the dust. There's a sophisticated Layout mode with a variety of options and tools. You can specify that a field be unique, be not empty, hold a value within a certain range, or use a serial number; you can even predefine a field's values, which show up in a scrolling list when you're entering data. Reports, designed as another layout within the database,

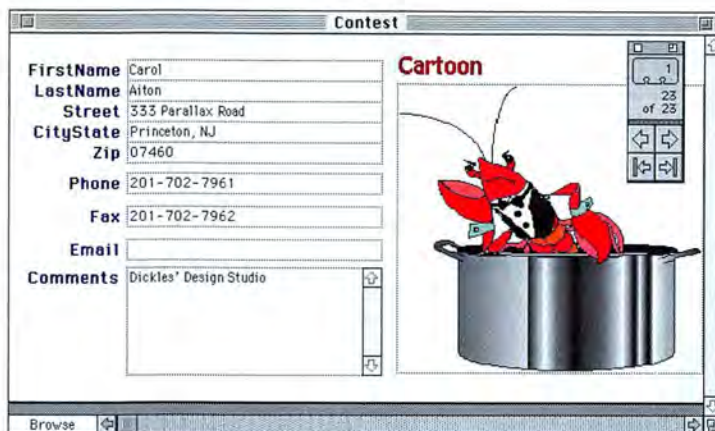


Figure 2: GreatWorks is a solid value, second only to ClarisWorks. The GreatWorks database module resembles earlier versions of FileMaker Pro and gives you great freedom in designing layouts, including picture fields. A floating palette lets you easily navigate through the records.

let you apply almost any function across a group of records as easily as applying a function to a single record.

Spreadsheets: A Good Group

The spreadsheet modules in each of the integrated packages are much the same — and they're all good. They have similar interfaces for data entry and printing; allow full formatting of text or numbers on a cell-by-cell basis; and provide a core of mathematical, statistical, financial, and trigonometric functions. Microsoft Works and WordPerfect Works offer 64 and 65 functions, respectively; ClarisWorks has 100, and GreatWorks has 101. The main difference is that the latter two programs include string-handling functions.

Microsoft Works comes in last in a close race, because it can't handle strings, even within other functions. So, for instance, using `ISBLANK()` in Microsoft Works returns a misleading `TRUE` when a cell has text in it; a formula like `IF(A1>100, "yes", "no")` is invalid. WordPerfect Works, which doesn't have string functions, can return a text string. It also provides find and change functions, which Microsoft Works doesn't.

ClarisWorks and GreatWorks provide a greater variety of functions, although they're both missing the cell-note capability of the other two programs. ClarisWorks beats GreatWorks in some minor areas, such as being able to copy and paste formats from one cell to another.



GreatWorks

The database module in GreatWorks is a vast improvement over Microsoft Works on every level. It's easy to set up and has a variety of tools and options in the Design mode.

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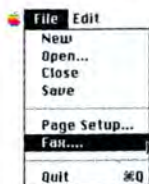


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Integrated Software

Integrating the Future: OLE 2.0 and Amber

If Microsoft and Apple are right, the term *integrated software* will soon have a new meaning and integrated packages, such as those discussed in the main part of this article, will cease to exist. The shift involves a move away from integrated applications toward a broader concept of an integrated desktop. The keys to this shift are two technologies being independently developed (naturally): one, called OLE (Object Linking and Embedding) 2.0, is from Microsoft, and the other, code-named Amber, is from Apple.

The New Integration

What Microsoft and Apple agree on is abandoning the current model of "application-centric" computing for a more free-form concept of "document-centric" computing. In an application-centric environment, all the functions we need in order to perform a task tend to be contained in a single application, which makes our applications bigger, more complex, and redundant. For example, practically every word-processing and page-layout application has a spelling checker, but every one works differently, so you have to learn how each one works, even though you're doing the same thing with them.

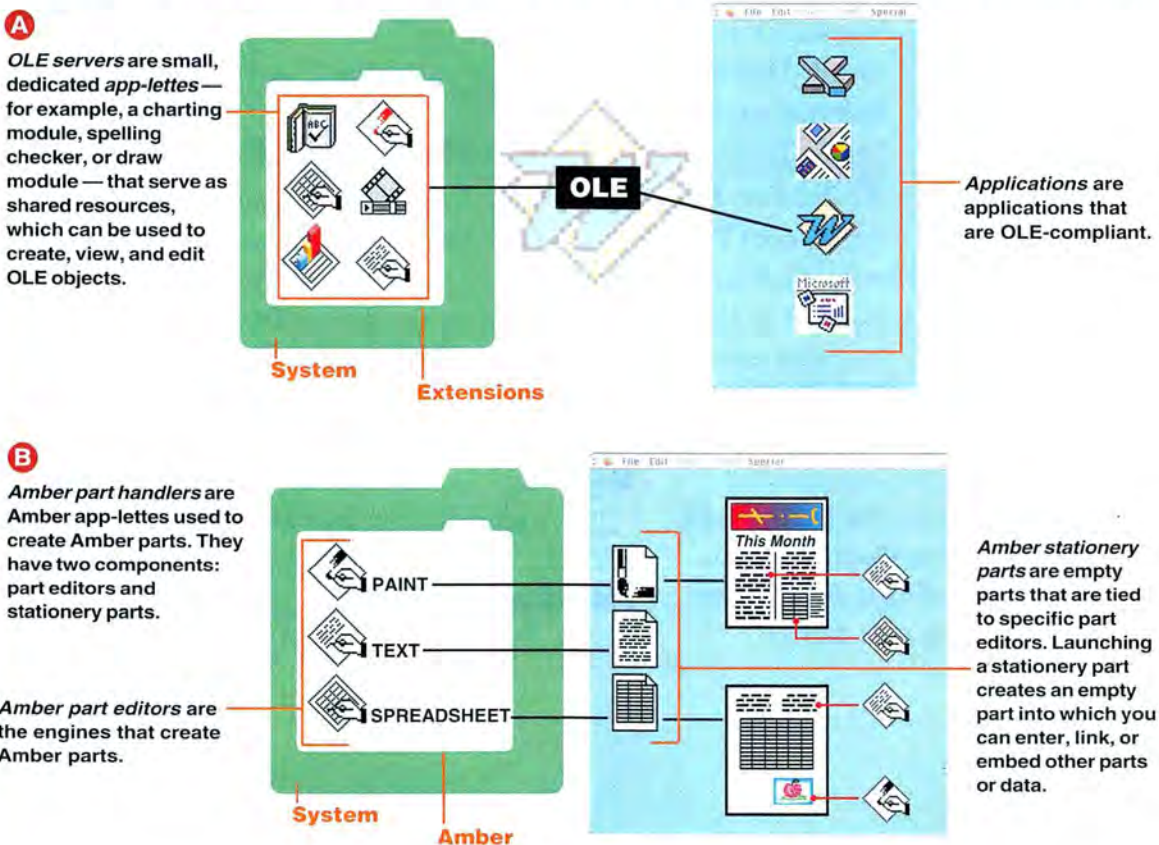
With document-centric computing, you're no longer bound to the features of a single application. Instead, your focus is on the document, and when you need to perform different tasks (say,

you need a small spreadsheet in the report you're creating in your word processor), you simply select that tool from a menu. By creating an environment in which applications can share resources (spelling checkers and graphing modules, for example), OLE 2.0 and Amber will make it possible for users to create complex, compound documents without having to switch applications to create and edit different types of data.

Sharing Resources

Imagine your workstation as a microcosmic network to understand the metaphor underlying OLE. In this metaphor, what's on your storage devices is servers and clients. The "servers" are "applications," dedicated "app-lettes" (such as multimedia players and editors, spelling checkers, charting modules, and simple graphics engines) and documents that can share functionality or data. The clients are applications and documents that make use of that functionality and data (see Figure A).

With Amber, the model is more like a distributed network. An Amber document eliminates the concept of a base, container application into which various other data elements are linked or embedded in favor of a nonhierarchical approach in which there are only data elements (called *parts*) that contain other data elements (see Figure B). So if you are creating a report in a text part and find that it would make more sense to do so in a page-



layout part, all you have to do is open a page-layout part and drag all of your text-part elements into the page-layout part.

OLE 2.0 and Amber are the system-software protocols and glue that control how all the data elements communicate, keep track of data relationships, and store version information for the various pieces of a compound document. To see how a compound document built with OLE 2.0 or Amber might look and work, see Figure C.

You Win

Once OLE and Amber have become widely adopted, you'll enjoy several advantages. First, you'll spend less time learning how to use software and more time getting things done. Because OLE and Amber make it possible for a single application, or app-lette, to provide its functionality to any other application, you'll have to learn only a single interface to do a given task.

OLE and Amber also make it possible for you to edit your compound document's elements in place. So if you're in a text document and you need to edit the spreadsheet in that document, all you have to do is click (Amber) or double-click (OLE) on the spreadsheet rather than launch a spreadsheet application.

Both OLE and Amber will also support drag-and-drop across windows and applications, so moving data from one application to another will be more intuitive. Under the OLE/Amber

model, if you want to insert a graphic into a text document, all you have to do is select the graphic in its application and drag it onto the text-document icon (or into the open document) and release. No cutting and pasting.

Not Quite the Same

Although their basic function is the same — and Amber will be interoperable with OLE, so OLE objects and applications will work in an Amber environment — there will be a few differences between the systems. For example, Amber will support irregularly shaped parts, but OLE's objects must be rectangular. Also, Amber will support links to data stored on network volumes, but OLE 2.0 won't. (Microsoft says there's nothing in OLE 2.0 that precludes network support and that network support will appear in OLE 2.1, which should be released shortly after 2.0.)

You won't have to wait too long before you start seeing OLE applications. OLE 2.0 is, in fact, already shipping on the Windows side, and Microsoft has promised OLE 2.0 Mac applications by the end of the year. Other developers, including Aldus, have made similar commitments. Amber, on the other hand, is further out. Apple has promised to release the final version around the middle of 1994.

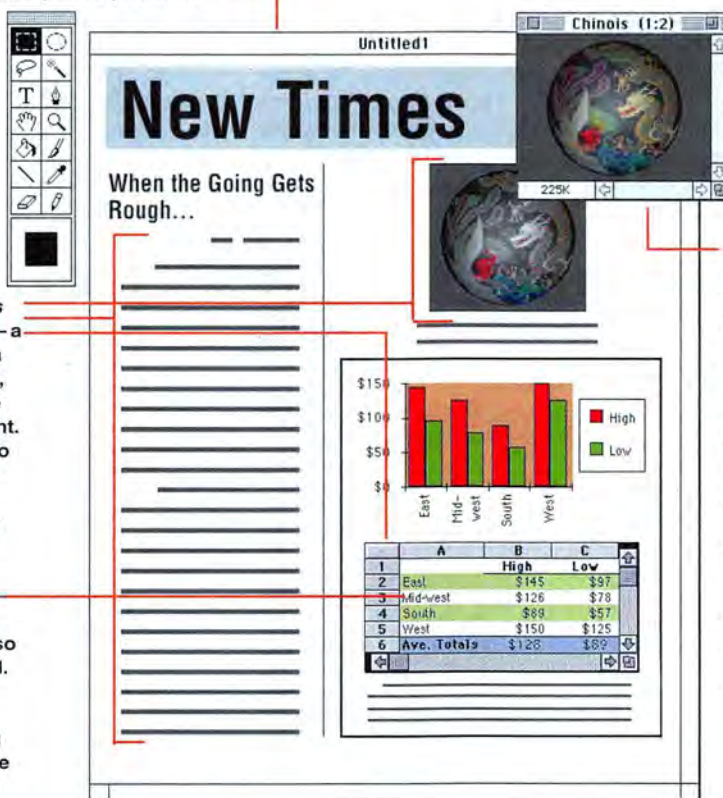
— Russell Ito



Containers (OLE) and parts (Amber) contain objects or parts.

Objects (OLE) and parts (Amber) are the pieces — a bit of text, a graphic, or a section of a spreadsheet, for example — that make up a compound document. An object or part can also contain other objects or parts, because you can nest objects and parts in other objects and parts.

Embedding (OLE and Amber) puts all the data into a container or part, so no external file is needed. When you select embedded data (shown here), the data's creating application takes over the menus and tools, letting you edit the data in place.



Linking (OLE and Amber) places an object or part into a container (OLE) or part (Amber) with a pointer to another document (or object or part) that contains the linked data. Selecting a linked object or part opens the linked document along with its creating application's tools and menus (shown here). If you don't have the creating application, OLE and Amber will let you substitute a compatible application.

Integrated Software



Microsoft Works

In Microsoft Works, all you have to do to create a chart is select the data cells, click on the chart tool, and draw a rectangle on the spreadsheet.

You can't judge a spreadsheet without considering its charting capabilities, and when you do, WordPerfect Works drops to the bottom of the list. Its charts are separate draw-layer documents that don't maintain a link to their data once they've been created. If you force an update when you change the spreadsheet data, you get a new chart document, so you lose any enhancements you made to the first one.

In GreatWorks, the charting module is also separate from the spreadsheet module, although the chart remains linked to the data. Refining charts is somewhat cumbersome, with many separate commands for things that would be more convenient to handle within a single dialog box. In addition to basic chart types, you can create pictographs, using a graphic as the basis for the chart.

In Microsoft Works, all you do to create a chart is select the data cells, click on the chart tool, and draw a rectangle on the spreadsheet where you want the chart to appear. You can choose from six types of charts; you have lots of control over the particulars, such as minimum and maximum values on the axes; and the program even has semilogarithmic scaling (see Figure 3).

But again, ClarisWorks outdoes the competition by a mile. The program provides perfect integration between spreadsheets and charting: Select some cells, choose the New Chart command, and select a chart type from

the dialog box, and the chart appears on the spreadsheet. There are more types of charts available in ClarisWorks than in the other programs and more built-in options (to save you trips to the draw layer) such as horizontal orientation, shadowing, tilting, and exploding for pie charts. The chart remains linked to the data even after you've graphically enhanced the chart. In Microsoft Works, by contrast, the chart loses its data link if you shadow the bars or explode the pie.

Graphics: Drawing and Painting

The graphics component of integrated packages is evolving. Originally, Microsoft Works offered a floating draw layer that let you superimpose graphics on word-processor documents; later versions let you draw on top of material created in other modules too. In the previous version of ClarisWorks, you did basic page layout in a graphics module — now you use the word processor for that (see Figure 4). But you can find true graphics capabilities — painting and drawing — in integrated packages.

Microsoft Works doesn't include a paint module, but its drawing functions are no longer limited to a floating layer. The draw module offers all the drawing basics, and because it's page-based, it lets you do some basic desktop publishing. (The draw modules in the other programs are document-based, so doing a multipage layout means working on an extremely large page that will be divided during printing. The other programs assume you'll do your layouts in the word-processing module.) The draw module provides linked text columns that are easy to set up but ridiculously limited. You put text into them by typing or pasting — you can't import a document you've created in the word processor. And when you paste, you lose your paragraph formats — indents, tabs, and justification — and there's no way to indent or tab from within the draw layer.

WordPerfect Works provides a draw module and a paint module. There's nothing spectacular about them, but there's nothing wrong either, beyond a few quirks such as the spray-can tool's using the color assigned to lines instead of the color assigned to fills. Both modules provide almost everything we've come to expect in the way of drawing and painting, but they're missing the fancier options, such as gradients.

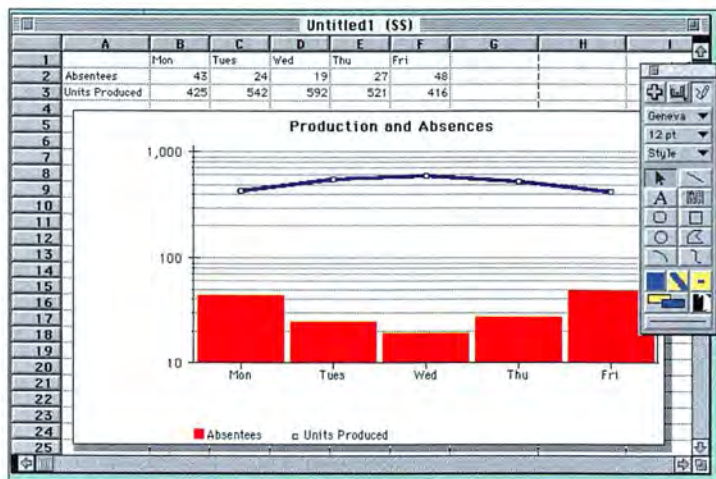


Figure 3: Microsoft Works used to own the field — but not anymore. It provides many charting options, including semilogarithmic scaling, as shown here. But enhancing a chart beyond adjusting colors, line weights, patterns, and fonts breaks the link between the chart and its data.

The GreatWorks draw module is more complete than WordPerfect Works' module, with its Bézier pen tool, line options, and more elegant feel — there are even little symbols in the tool palette to indicate which tools you can double-click on to get an Options dialog box. The paint module is also elegant and complete and even includes a gradient-fill option.

ClarisWorks has draw and paint modules that are about as complete as you could ask for, including a Bézier tool and 32 gradient fills. The material created in the two modules is easier to combine in ClarisWorks than it is in the other packages that offer both modules; there aren't superimposed draw/paint layers as in SuperPaint, but you can put a paint frame into a draw document or a draw frame into a paint document. And as a bonus, ClarisWorks also includes a basic presentation function that lets you create simple slide shows.

Communicating: By Phone and More

The telecommunications modules in these programs are clones of each other, although ClarisWorks and WordPerfect Works provide a phone book for a collection of numbers rather than forcing you to create a separate document for every number you dial. These are all bare-bones text-based communications programs for basic connections and file transfers. They're certainly the least important aspect of each package, because most people who use on-line services, such as CompuServe and America Online, use dedicated software.

But there's another kind of communication to consider: that between a program and the outside world of other applications.

All the programs can export and import text and open PICT files. Beyond that, the word-processor modules offer the most variety in import and export functions, using filters to save and open documents in the Word, Microsoft Works, MacWrite, WordPerfect, WriteNow, and RTF formats.

When it comes to the spreadsheet modules, Microsoft Works provides a variety of filters for opening and saving documents, including those in the following formats: Excel, Lotus, SYLK, PC Works, and earlier versions of Microsoft Works. ClarisWorks has fewer choices, but it includes saving

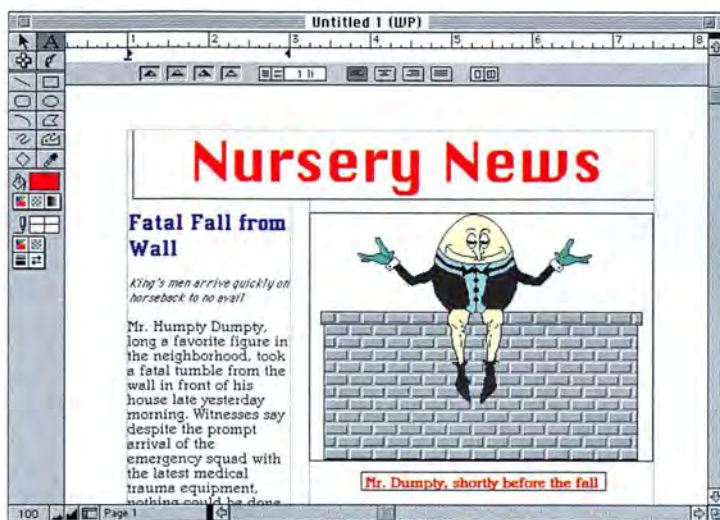


Figure 4: ClarisWorks is the one clear standout in the field. Its word processor, which includes variable-width columns and an integrated tool palette, serves as a basic page-layout application.

files in the Excel and SYLK formats and opening those as well as Microsoft Works files. GreatWorks and WordPerfect Works save only in their own spreadsheet formats, although both can open Microsoft Works spreadsheets and GreatWorks can handle older Excel files (version 2.2).

Every database module can import ASCII-text data, and some can read a few native formats. Microsoft Works can open PC Works files, and all the others, in deference to Microsoft Works' market penetration, can open Microsoft Works database documents. Only the data is read in, because forms and layouts are unique to each program.

You might think that there would be special communication between Microsoft Works and Microsoft's other products, or between ClarisWorks and Claris' other products, but there's not. The biggest disappointment in this area is the lack of easy transfer between ClarisWorks' database module and its big brother, FileMaker Pro: You can transfer data in the normal way, but you can't send layouts in either direction and neither program reads the other's file format.

Unfortunately, this lack of communication with the stand-alone world also keeps the integrated programs from being ideal PowerBook applications. Having to go through translation filters is a hassle, and there's no guarantee that everything will be translated correctly — if at all. Plus, the



ClarisWorks

ClarisWorks has draw and paint modules that are about as complete as you could ask for, including a Bézier tool and 32 gradient fills.

Integrated Software



Which Works?

With ClarisWorks clearly being the best integrated package on both a module-by-module basis and in terms of overall integration, what's to think about?

integrated programs spin the hard disk about as often as their more sophisticated cousins, so you don't conserve the battery either.

Total Integration

When is an integrated package really integrated? When it's ClarisWorks.

Microsoft Works doesn't deserve the designation "integrated." Here's the extent of its integration: There's data merge in the word processor, charts are linked to spreadsheet data (unless you enhance them graphically), and you can float a draw layer on top of material created in other documents. That's not integration. The Microsoft Works modules are like family members who live in the same house but barely speak to each other.


GreatWorks is also a collection of separate programs. It uses publish-and-subscribe for exchanging information among modules, and although it's nice to see *someone* using publish-and-subscribe for *something*, those functions were meant for linking independent applications, not for an integrated package. It doesn't feel integrated when you have to select material in a document, publish it, and then subscribe to it from another document. Granted, GreatWorks' Easy Publish and Easy Subscribe commands work like Copy and Paste between documents, but that makes only the original setup easy. You still have to move to another module to make changes to the embedded material, and you have to worry about three files instead of one if you're moving documents from one disk to another: Unless you move the original document, the edition file, and the document that publishes the edition, you lose the links. In addition, GreatWorks offers publish-and-subscribe only among certain of its modules. As noted before, you can't link the word processor and the outliner.

WordPerfect Works also uses publish-and-

subscribe to link its modules, but it does it more seamlessly. If you're in the word processor and want a piece of a spreadsheet, you draw a rectangle with the frame tool and select Spreadsheet from the dialog box. When you want to edit the spreadsheet frame later, you just double-click on it. But because publish-and-subscribe is going on behind the scenes and the spreadsheet module is actually launching, the process is slow — and you still have the problem of edition files as the intermediaries between documents.

ClarisWorks foreshadows the future of Macintosh computing, if we believe Apple's and Microsoft's prediction of "document-centric" rather than "application-centric" computing. (That is, you will be able to do whatever you want to a document without being limited by application-specific tools. See the "Integrating the Future: OLE 2.0 and Amber" sidebar.) ClarisWorks takes a frame approach, in which you draw a frame in a document in one module to use the capabilities of another module. The switch to the other menu bar is instant, and the material is truly embedded in the one document rather than being dependent on any other file.

Which Works?

It's not often so easy to decide which is the best in a group of programs that purport to do the same thing. GreatWorks is a great package at about half the price of the others, and if you're on a tight budget, it's a good choice. But with ClarisWorks clearly being the best on both a module-by-module basis and in overall integration, and at only \$50 more than Microsoft Works and WordPerfect Works, what's to think about? 

Sharon Zardetto Aker is a frequent contributor to *MacUser*. Her work in progress is the *Mac Almanac*, to be published by Ziff-Davis Press.

Table 1: Integrated Software

	ClarisWorks 2.0 ★★★★	GreatWorks 2.0.3 ★★★★	Microsoft Works 3.0 ★★★½	WordPerfect Works 1.2 ★★★★
List price	\$299	\$129.95	\$249	\$249
Company	Claris Corp. 5201 Patrick Henry Dr. Santa Clara, CA 95052 408-727-8227	Symantec Corp. 10201 Torre Ave. Cupertino, CA 95014 408-253-9600 408-253-4092 (fax)	Microsoft Corp. One Microsoft Way Redmond, WA 95052 206-882-8080	WordPerfect Corp. 1555 N. Technology Way Orem, UT 84057 801-225-5000 801-228-5377 (fax)

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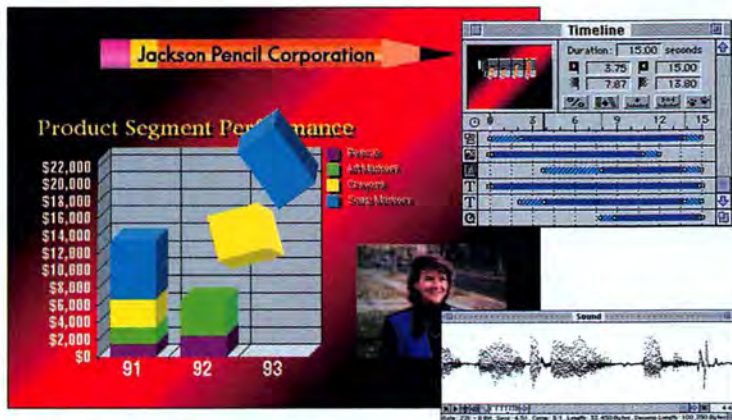
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Wake Up the



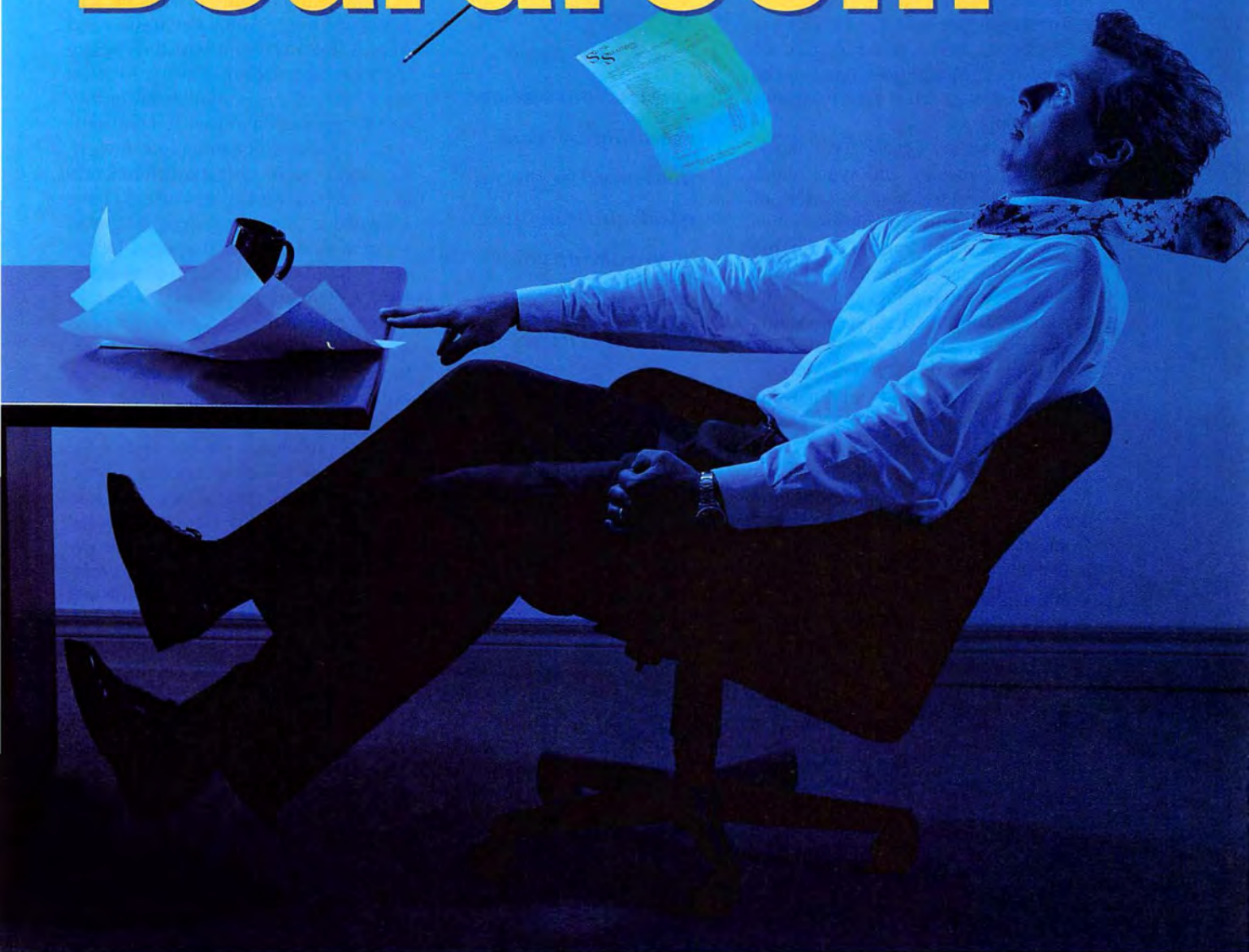
Multimedia presentations combine QuickTime movies, animation, and sound to make your audience sit up and take notice.

BY SHELLEY CRYAN

It's the middle manager's nightmare. You've worked long and hard to devise an ingenious strategy to unload your company's abundant stock of glow-in-the-dark wallpaper. To sell your idea to the CEO, you've prepared a speech detailing brilliant advertising, pricing, and distribution plans. But while visions of a fat bonus dance in your head, the CEO is snoozing through your presentation.

PHOTOGRAPHY: WALT DENSON

Boardroom



You might have avoided such a debacle by using one of the excellent slide-making applications that have been available for more than five years (see "Center-Stage Software," July '93, page 116). But with a greater investment of time and effort, you can now deliver a presentation that capitalizes on the very latest boardroom trend: multimedia.

Multimedia presentation software lets you convey

valuable information more vividly through more-dynamic visuals. For example, you can show your company's changing market share by slicing pie charts over time, depict expansion plans by showing subsidiaries that spin off toward the future, or project future sales by lighting up profit centers across the country. And of course, a multimedia presentation wouldn't be complete without your company's logo flying across the screen.

Multimedia Presentations

To accomplish such feats, multimedia presentation software differs from its slide-making counterparts in a few fundamental areas. First, your final output medium is the computer screen rather than 35mm slides. Second, all multimedia-presentation-software applications offer some degree of interactivity. In addition, most of the programs come with at least basic animation tools.

The true forte of these tools, however, is showcasing and synchronizing media elements from a variety of sources, including animations, pictures, text, sound, and QuickTime movies. The added element of time that most of these multimedia presentation programs include accounts for the extra layer of complexity — as well as much of the added pizzazz — that serves to set them apart from slide makers.

Don't let this increased complexity scare you away. All the multimedia presentation programs we tested — Action!, from Macromedia; Cinemation, from Vividus; MovieWorks, from Interactive Solutions; Passport Producer, from Passport Designs; and Special Delivery, from Interactive Media — are geared toward business presenters who create training materials, proposals, and kiosk displays rather than toward multimedia gurus. A quite promising addition to this group of products

PRESENTATION

TIP

Use special effects sparingly. Too much on-screen activity confuses your message and annoys your audience. Use special effects and transitions to wake up your audience or to guide them to specific points.

— Astound — was not yet shipping at press time (see the “Astound Your Audience” sidebar).

Multiple Approaches

In the world of slide-making presentation software, Aldus Persuasion and Microsoft PowerPoint, with their nearly identical approaches, have a lock on the market. There is no such uniformity and dominance among entry-level multimedia presentation programs. Instead, the varying approaches and different creation and editing features offered have spawned a dogfight. Some programs — such as Action! and Special Delivery — build on the familiar slide metaphor. Cinemation and MovieWorks, as their names suggest, treat presentations as movies. Passport Producer's interface, which resembles a multitrack familiar to music-editing aficionados.

Each of the programs we tested has a different view of the needs of business presenters. On one end of the spectrum is Special Delivery, which offers virtually no media-creation or -editing tools, preferring to function as a streamlined presenter of media elements created with other applications. MovieWorks, at the other extreme, provides separate, linked applications for creating and editing sound, text, and pictures in addition to a core presenter application. The other programs fall somewhere in between, offering a few rudimentary media editors. However, none of the media creators or editors fully substitutes for dedicated third-party editing applications such as Adobe Premiere or Macromedia's MacroMind Director, so you shouldn't rely strictly on the tools included in your multimedia program.

Additionally, none of the programs evaluated here has text-handling or charting features that can compare with those found in slide makers. Sophisticated outlining features, spell checking, and find-and-replace are completely absent. Also, the top slide makers provide better predesigned backgrounds. For these reasons, you may often want to import static slide presentations into your multimedia presentation program. Some, such as Cinemation, make this process a breeze, whereas others, such as Action!, offer no streamlined way to do this.

Because there is no consensus among these programs as to what features they offer, judging them by mouse rating alone can be deceptive. For example, we did not lower Passport Producer's mouse rating because it lacks interactivity tools. Instead, the ratings reflect how well each program meets its objectives. Because Producer is touted as a fine-tuned synchronizer and presenter of disparate media elements, we judged it on that basis. To



Figure 1: Use Action!s Timeline window (shown at the bottom of the screen) to adjust start times, end times, and durations of objects' appearance in your scenes. The horizontal bars representing objects are color-coded and you can type in descriptive names, but other programs offer better visual cues. Action!s tools for creating buttons and for linking objects are nicely executed, though.

find the best-performing program that matches your personal working style, check out the pros and cons and the features of each program (see Tables 1 and 2).

Be aware, too, that although this burgeoning category of software offers exciting new ways to design presentations, it still has some serious kinks that need to be worked out. These programs enable you to play multiple media elements simultaneously, but a complex presentation may run unreliably on all but the fastest, RAM-heavy computers. If your hardware is overburdened, QuickTime movies will drop frames and appear jerky, PICT files may appear later than called for, and sound files may not play at all. Those who work on low-level to midrange Macs will fight a constant battle between the capabilities of their program and the limitations of their machines.

Action!

Action! 1.01 offers interactivity and animation tools bundled in an application that builds on the slide metaphor of static-presentation packages. To take best advantage of the program, it helps to be familiar with PowerPoint or Persuasion, but Action! is significantly more complex than either of these.

Action! presentations are divided into scenes, which resemble slides. Unlike with slides, however, you have to contend with the added element of time. Objects — such as text, graphics, sounds, and movies — enter and exit scenes over time. To help you manage all this, Action! gives you a Timeline window, which displays horizontal bars representing each object in a scene (see Figure 1). These bars are stacked up under a time line, which is marked off in seconds for the duration of each scene. If an object appears in the scene at the 5-second mark and exits after 20 seconds, its bar will be placed accordingly under the time line.

Changing an object's entrance time is as easy as dragging the bar to where you want it; shrinking or stretching bars changes how long the object remains in the scene. In general, though, the lack of good visual cues, such as those in Cinemation and Producer, makes Action! harder to use than these competitors. Action! does let you type in a name for each object on its corresponding bar, but a simple horizontal bar can't compare to the visual feedback you get from the thumbnails provided by other programs.

The tool palette houses Action!'s basic drawing and text tools as well as tools for adding sound and interactivity. You use the button tool to add interactive buttons to presentations. Clicking



Figure 2: Frame-based Cinemation offers a Filmstrips window, which displays thumbnails of each frame. Click on a frame in the Filmstrips window, and it will appear in the main window, where you can edit its objects or add animation or interactivity. It's hard to set sequence durations with this approach, however.

on buttons jumps you to specified scenes or invokes a pause or continuation. The link tool lets you add these capabilities to any object already in the scene. Dialog boxes associated with these tools are well designed, filled with convenient pull-down menus and radio buttons.

One way to pull together a presentation in Action! is to import slides in PICT format from a slide-making program and then add sound, motion, and transitions to them. Alas, you have to import the slides one at a time, unlike with the one-step-grabs-all approach of Cinemation.

A faster method may be to use one of the ten included templates, which contain modifiable backgrounds, formatted text, simple graphics, and motion paths. Substitute your own data and fine-tune it, and you're set. You can also design your own templates.

Because of Action!'s complexity and lack of good visual cues, you might find yourself climbing the learning curve each time you use the program if you use it infrequently. It's best suited for those who have to produce many presentations and thus have a better chance of remembering how everything works.

Cinemation

If you'd like a quick and easy way to animate existing static presentations created in PowerPoint or Persuasion, look no further than Cinemation 1.0. Cinemation's ability to seamlessly import and animate slides is perhaps the

PRESENTATION

TIP

To ensure better playback on low-end Macs, create 8-bit animations and save them with the QuickTime animation compressor set at highest quality. You'll get smaller file sizes too.

Multimedia Presentations

program's greatest asset. Another virtue is its extremely short learning curve, which makes creating presentations from scratch a snap. If you create only a few presentations a year, the program's easy-to-use structure won't require you to pull out the manual each time you use it.

Cinematic presents you with a Filmstrips window, which contains thumbnails of each frame in your movie (see Figure 2). Click on any frame, and it appears in the main window, which is where you do all design and animation work. A palette with VCR-like controls lets you navigate through your emerging movie. The tool palette toggles between draw/paint and animation tools and is so versatile that you'll rarely schlepp up to the menus.

In Cinematic, you can animate text; objects; and even movies, moving them around the screen, changing size, or rotating. Animating movies yields particularly eye-catching results. For example, you can make a movie of a bird with its wings flapping, import that

PRESENTATION

TIP

When designing presentations for others, build in controls that make it easy for them to adjust the sound level, jump back to previous sections, or quit the presentation at any time.

movie into another presentation, and make the flapping bird fly across the screen.

There are three ways to easily create an animated sequence: record motion as you manually drag an object across the screen; create beginning and ending frames and have Cinematic fill in the frames between them; or draw animations frame-by-frame, using Cinematic's excellent ghosting features. Of course, you can always use the provided animation templates to automatically animate bullet points and objects in predefined paths.

To animate a PowerPoint or Persuasion slide show, save it in Scrapbook format. Launch Cinematic and import the file, and Cinematic will put each slide into a separate frame. (Version 1.0 doesn't support PowerPoint 3.0 files, but the next release, due out by the time you read this, does.) Then spice up your frames with any of Cinematic's animation, draw, and paint features. As with any Cinematic presentation, you can add interactive links among slides. Use the link tool to instruct the

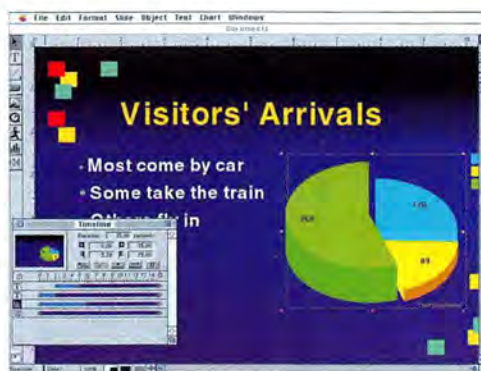
Astound Your Audience

The newest entrant into the multimedia-presentation-software market, Gold Disk's Astound, began shipping too late to be included in this roundup. However, the beta version we saw indicates that Astound is shaping up as a strong contender.

Astound most closely resembles the top slide makers, with a few added twists: basic animation, time-dependent transitions, and interactivity. Its similarity to the slide-based programs sets it apart from the other products in this roundup. Astound's robust Outline view; text-handling features, including a spelling checker and line- and paragraph-spacing control; charting capabilities; and superior background-gradient and -pattern options are absent in the other multimedia presenters.

In fact, Astound offers so many of the features found in top slide makers that it competes with Microsoft PowerPoint and Aldus Persuasion as hotly as it does with any of the multimedia presenters. By straddling the two markets, Astound occupies an interesting niche. Other multimedia contenders lack high-end slide-making features, and slide makers currently lack controllable animation and interactivity. Before Astound came along, you had to work with both types of programs to get both sets of features.

Astound's animation features aren't as comprehensive as



those you'd find in, say, MovieWorks. You can define straight-line and diagonal entrance and exit paths for any object, including PICS animations, and you can set durations for the enter, hold, and exit phases. This lets you create such things as a bird flying onto the screen, stopping for a moment, and then flying off.

Transition effects really shine in Astound. Along with a host of standard wipes, dissolves, and fades, the program provides some more-unusual transitions that could really be considered mini-animations in themselves. For example, you

can have text drop into place letter by letter or you can set drawn objects spinning.

Tools for adding interactivity cover the basics. The button tool lets you add interactive buttons or make any object an interactive control. You can set buttons to send you to a specified slide and to pause, resume, and play sound.

Priced at \$399, Astound is set to ship with a healthy assortment of sample pictures, animations, sound, and QuickTime movies. Like the other multimedia presenters, it supports a wide range of formats for importing. The inclusion of both Mac and Windows run-time players expands users' distribution options.

Gold Disk, 385 Van Ness Ave., Suite 310, Torrance, CA 90501; 310-320-5080.



Figure 3: MovieWorks offers excellent animation-path-editing tools. Here, note the path that dictates how a PICT file enters a scene. You can edit the path easily by dragging on the handles. Unfortunately, in other respects, the program is encumbered by a confusing structure and a murky interface.

movie to jump to a specific frame when a viewer clicks the mouse or when a designated sound finishes playing. Add transition effects to make the jump more professional-looking.

Despite Cinemation's overall excellence, the program has a few drawbacks. A bug that Vividus says crops up with certain hard drives (including this reviewer's 80-megabyte Apple hard drive) makes it impossible to keep the Cinemation application and data files anywhere but on the desktop. However, the problem vanished in the beta release of version 2.0 that we tested. (The new version will also have more control over the playback of QuickTime movies, according to Vividus.)

Because Cinemation is frame- rather than time-based, setting sequence durations is a little tricky. The program includes a run-time player, but enormous files cause distribution problems (see the "Pass-Around Presentations" sidebar). A typical, 266-frame movie consisting of four main animated scenes, including sound and interactivity, occupies a whopping 1.6 megabytes. You can reduce this by about 85 percent by saving in an unaccelerated Cinemation format, but the first time a viewer plays a presentation saved in this format, it will run horribly slowly. As a workaround, you can program an early pause and have the presentation load into RAM before it plays.

MovieWorks

With its included applications for creating and editing sound, text, and paint-style illustrations, MovieWorks 1.1 seems like a bargain at \$195. A fourth bundled application, the Composer, is the heart of this

offering and is where you collect presentation elements, animate them, insert interactive links, and save the result as a QuickTime movie. Despite the lure of all these promised capabilities, however, MovieWorks comes up short. Although the animation-path-editing features are excellent, the Composer is needlessly awkward and sluggish.

The root of the problem is Composer's overall structure. The idea is to create a presentation by linking together a collection of movies, which you also create within Composer. The concept seems simple, but its execution is confusing.

Within a presentation, you create as many movies as your RAM allows. Pretty quickly, you can get lost in a sea of movies, especially because MovieWorks fails to provide an easy way to keep track of them. Its MediaBase window helps you control elements in each movie but is little help in giving you a clear overall schematic of your entire presentation.

Tracking elements in individual movies is also murky, even with the MediaBase window and its accompanying TimeView window, which shows every element and its duration. The layout of the TimeView window and a lack of good visual cues make the learning curve steeper than it needs to be.

MovieWorks does shine in a few significant areas. It is QuickTime-based, meaning that its presentations' default format is QuickTime. This lets MovieWorks take advantage of QuickTime's compression capabilities and helps keep presentations in sync on slower systems by dropping out frames as needed. However, this too has its drawbacks. MovieWorks requires you to

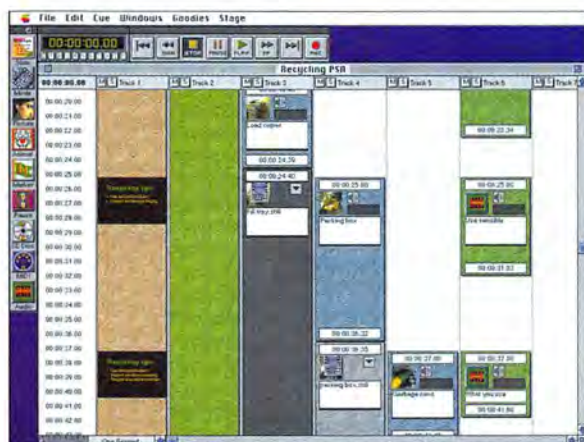


Figure 4: Passport Producer's Cue Sheet, which resembles a multitrack mixer, makes it easy to synchronize multiple media elements. Note the icon bar on the left, which contains an icon for each type of media element you can place on the Cue Sheet. Drag an icon to any track to get a dialog box that asks you to select a file or launch a program to create a new element.

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ZiffNET

Mac

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Text Toy	Eliza: It's a text editor and a personal psychiatrist all in one!	ELIZA.SIT Library 1 (Applications)
File Management	Tidy It Up! II: It's the ultimate System folder manager for System 7.	TIDY7.SEA Library 1 (Applications)
System 7 Must-Have	File Buddy: Modify or get the scoop on all your files.	FILEBU.SIT Library 1 (Applications)
Trivial Pursuits	Maelstrom: The best space shoot'em up around. It's got color, cool sounds, and excitement.	MAELST.SEA Library 1 (Applications)
Number Crunching	Calculator II: This small application is a really excellent replacement for the Apple Calculator DA.	CALCII.CPT Library 1 (Applications)
Word Processing Add-On	Color Toolbar for Word 5.1: Replace the ho-hum Word toolbar with this zippy color bar.	COTOOL.SIT Library 3 (Extensions)
Menu Bar Magic	Zipple: It's a menu bar enhancer that will put the zip back in your Finder.	ZIPPLE.CPT Library 3 (Extensions)
Printing Utility	Print2Pic: Distribute your documents in a form any Mac user can read and print — with formatting intact!	P2PICT.CPT Library 3 (Extensions)
A Better Interface	Greg's Buttons: System 7 extension that replaces standard buttons with splendid 3-D versions.	BUTTON.CPT Library 3 (Extensions)

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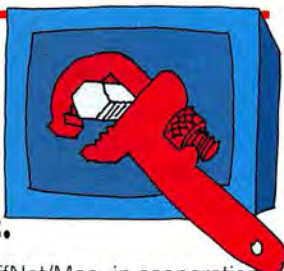
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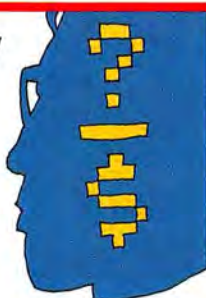
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Multimedia Presentations

snooze through a time-consuming compression process each time you make modifications, before you can play them back reliably.

Another strong point is MovieWorks' path-editing tools, which are unsurpassed in this group (see Figure 3). You can use MovieWorks' tools to create straight, rectangular, oval, curved, or polygonal paths. Handles along these paths make them easy to edit, so your picture, movie, or text will move just the way you want it to.

Unfortunately, these assets don't outweigh the flaws. Opt for an easier-to-use, speedier program. As those ubiquitous movie reviewers might say: two thumbs down.

Passport Producer

Passport Producer 1.1 is narrower in its scope than most of the other programs in this category. Its interactive controls are severely limited, and it offers no animation tools. Instead, Producer focuses on integrating existing media clips into a coordinated, well-timed, polished presentation. This emphasis allows Producer to offer great depth in this area. Its extremely intuitive

PRESENTATION



Reveal information in steps. If the first scene shows all of your bullet points, the audience will read it instead of listening to you.

interface, extraordinary application-linking capabilities, and support for external devices make Producer particularly well suited for presenters who have access to source materials and dedicated, stand-alone media-creation and -editing programs — and who don't need interactive features.

Producer's blissfully streamlined interface centers on five elements: the Cue Sheet, where you place media clips and organize them into tracks; the Cue Palette, where you access media clips; the Counter, which displays the current position in the Cue Sheet; a collection

of VCR-like controls called the Transport; and the Stage, where the presentation is displayed (see Figure 4).

This well-designed interface, along with the program's excellent tutorial, allows you to get up and running with Producer quickly. Use the Cue Palette to select the type of file you'd like to place in your presentation — choose among slide-show, movie, picture, animation, CD-ROM, MIDI, or audio files. Simply drag the appropriate icon to a track on the Cue Palette, and you'll be presented with a dialog box asking you to locate a desired file or, in some cases, create a new file.

If you opt to create a new file, Producer will launch one of its included editors or a third-party application of your choice. With the exception of the sound and MIDI editors, Producer's editors are bare-bones, so you'll often want to turn to a richer, dedicated third-party application. Just make sure you have enough RAM to support both Producer and the third-party program.

In addition to the extensive MIDI tools, Producer's other audio features help you create a professional-sounding presentation. Although it's not unusual to be able to adjust the volume of each audio cue separately, it is unusual and handy to be able to alter the volume within a cue. Imagine a two-minute music cue that plays while a few slides and movies play, with a narrator breaking in occasionally. You can easily reduce the volume of the background music while the narrator is speaking and return it to the original volume later.

Producer can play files from a variety of formats and sources. The program supports standard audio-CD tracks as well as external and internal microphones and many MIDI devices. If you have a PowerPoint or Persuasion presentation you'd like to incorporate into a Producer presentation, just save it as a series of PICT files and use Producer's Add All command, in the Picture Cue editor. If you're trying to synchronize playback to another device, such as a video deck, you'll appreciate the ability to work in SMPTE (Society of Motion Picture and Television Engineers) time code. You can also work in hours/minutes/seconds.

Pass-Around Presentations

Most programs sensibly include a run-time player, which lets you freely distribute presentations to people who don't have the host application. Considering that interactive multimedia presentations are destined for on-screen viewing, a run-time player is essential. However, just having a run-time player doesn't mean you're out of the woods. Presentations created with multimedia software are much trickier to distribute than slide presentations.

Viewers using Macs that are slower than the one on which you created your presentation will have synchronization problems. (Some of the programs save in QuickTime format, which solves synchronization problems, but QuickTime movies can appear jerky on slow Macs.) Additionally, when QuickTime movies are part of your presentation, Apple's QuickTime extension must be installed in the System Folder of the Mac that's displaying the presentation.

Don't forget that you have to include all source files with your presentation, which can make it hard to fit everything onto a floppy disk. Even though some programs gather everything together for you, the elements still hog disk space.

As with slide presentations, you'll be better off if you stick to core fonts. Text formatted with jazzy but unusual fonts may look great on your Mac but will show up as an ugly default font if they're not loaded in the computer on which your presentation plays.

With the proper hardware, you can eliminate distribution problems by printing to video. Most programs reviewed here offer built-in functions to streamline this process. But with a videotape, interactivity is out the window.

Overall, Passport Producer brings a wide variety of media elements together smoothly and easily and allows for professional-level control over timing. Its excellent support for MIDI devices and other external devices makes Producer the choice for media-intensive presentations in which interactivity and user-defined animation are unnecessary. The crashing problems that plagued an earlier version (see review, May '93, page 71) didn't show up in this update. As we went to press, Passport announced version 2.0, which promises interactivity, path-based animation, transition effects, and other features that should make Producer more accessible as an interactive-presentations program.

Special Delivery

Special Delivery 1.1 is a single-mission piece of software: You use it to create highly interactive presentations. Period. It lets you select snippets of movies and sounds and draw simple lines and shapes, but otherwise the program provides no real media editors or creators. Animation tools are absent. There is also no time-line view, because presentations created with Special Delivery run at the pace set by the person viewing the presentation. You can design self-running presentations, but only by setting a simple duration for each slide.

This narrow scope is intentional. Special Delivery bills itself as an easy-to-use presenter of media elements to which you add extensive interactive controls. But you pay a price: The lack of time-based cues, sophisticated sound control, animation capabilities, and drawing tools makes it difficult to create presentations that are as eye-popping and professional-looking as those you can create with other packages.

On the plus side, Special Delivery's familiar slide format does make it relatively easy to learn. The most difficult aspect is getting used to a plethora of new tools and views associated with the interactive features. Although its Layout, Note, and Run views are familiar, the Button view, where you specify how you want interactive controls to work, is novel (see Figure 5).

The options for the interactive controls are more extensive than in any of the other programs tested. In addition to the standard Go to Slide, Next, Previous, Pause, and Resume you find in most programs, Special Delivery offers additional controls useful to presenters and kiosk-display creators. You can add Play, Stop, Rewind, and Sound buttons to control the playback of QuickTime movies; set buttons to control sound; and click on a button or another designated area of the screen to hide or display graphic elements or to hide or display the cursor.

Unfortunately, the sophistication of the interactive controls doesn't carry over into other areas of the program. There's no on-line help or Balloon Help, and Special Delivery does not offer Producer's handy hot-link



Figure 5: In Special Delivery, you set up all interactive elements in Layout view (shown here with all elements active) and designate their function in Button view. You toggle between views by clicking on icons in the top right corner. Note the interactive elements: The three horizontal boxes fill with text when a viewer clicks on the bullet points; to the right, a QuickTime movie will play, rewind, and stop when you select the appropriate buttons.

feature to third-party applications. At this writing, there is no run-time player, although by the time you read this, Interactive Media plans to have one available.

Because of its slidelike orientation, Special Delivery may seem like an interactive version of PowerPoint or Persuasion, but unlike the newly introduced Astound, it lacks the outline view, background options, charting, and text-handling features provided by these top slide makers. You can set a graduated-fill background by placing a graduated-fill file (you can't set it from the menus), but then screen redraw slows to a crawl. Are the additional interactive controls really worth it? Probably not. You can create snazzier presentations with other programs if you're willing to give up these secondary interactive features.

The Bottom Line

If you're looking for both interactivity and animation, Cinemation is your best bet. Its easy-to-use interface gets you up and running quickly, and its animation-path-editing tools are excellent. Even if you don't need animation, you'll prefer Cinemation or Action! over Special Delivery. If you don't need tools for setting up interactive buttons or for animation, consider Passport Producer. You can coordinate elements much more easily in Producer than you can in the other programs, and Producer conveniently links to third-party editors and external devices.

Shelley Cryan runs a consulting business in New York that specializes in helping companies computerize their graphic-design departments.

continues ►

Multimedia Presentations

Table 1: Presenting Pros and Cons

	Action! 1.01 \$\$\$½	Cinematic 1.0 \$\$\$\$	MovieWorks 1.1 \$\$	Passport Producer 1.1 \$\$\$½	Special Delivery 1.1 \$\$\$
List price	\$495	\$495	\$195	\$149	\$399
Pros	Good transition effects. Well-designed dialog boxes.	Excellent interface. Easily imports and animates static slide presentations.	Excellent animation-path-editing tools. QuickTime-based format keeps events in sync on slower Macs.	Excellent interface. Can launch third-party editors. Supports wide range of external devices.	Extensive interactive controls. Familiar slide format is easy to learn.
Cons	Lacks good visual cues in Timeline window.	Durations are hard to set. Some users experience bugs.	Needlessly complex interface. Slow.	No animation tools. Limited interactivity.	No animation tools. Slow screen redraw with gradients.
Company	Macromedia 600 Townsend St. San Francisco, CA 94103 800-288-4797 415-252-2000	Vividus Corp. 651 Kendall Ave. Palo Alto, CA 94306 415-494-2111	Interactive Solutions 1720 S. Amphlett Blvd. Ste. 219 San Mateo, CA 94402 415-377-0136	Passport Designs, Inc. 100 Stone Pine Rd. Half Moon Bay, CA 94019 415-726-0280	Interactive Media Corp. P.O. Box 0089 Los Altos, CA 94023 415-948-0745

Table 2: Features of Multimedia Presentation Programs

■ ■ ■ = Above average

■ ■ = Average

■ = Below average

NA = Not applicable

	Action! 1.01	Cinematic 1.0	MovieWorks 1.1	Passport Producer 1.1	Special Delivery 1.1
Ease of use	■ ■	■ ■ ■	■	■ ■ ■	■ ■ ■
Interactivity	■ ■	■ ■	■ ■	■	■ ■ ■
Animation tools	■ ■ ■	■ ■ ■	■ ■ ■	NA	NA
Overall interface	■ ■	■ ■ ■	■	■ ■ ■	■ ■
Media-creation/editing tools					
Sound	NA	■	■ ■ ■	■ ■ ■	NA
Draw/paint	■	■	■ ■	NA	■
Tutorials	NA	■ ■ ■	■	■ ■ ■	■ ■ ■
Background options	■ ■ ■	■ ■	■ ■	■ ■	■ ■
Templates	■ ■	■ ■ ■	NA	NA	■ ■
Slide import	■ ■	■ ■ ■	■ ■	■ ■ ■	■ ■ ■
Transition effects	■ ■ ■	■ ■	■ ■	■ ■	■ ■
Clip-media selection	■ ■	■ ■	■	■ ■	■ ■
Import formats					
Sound	AIFF, SoundEdit	snd, SoundEdit	AIFF, snd	AIFF, MIDI, SoundDesigner	AIFC, AIFF, sfil
Still images	PICT	PICT	PICT	PICT	PICT, PCT0, EPSF, TIFF, PNTG, SCRn
Movies	QuickTime	QuickTime	QuickTime	QuickTime	QuickTime
Animations	PICS	PICS	PICS	PICS	NA
Other	NA	NA	ASCII	TEXT, ASCII, CD-DA	NA
Minimum requirements					
Application RAM	2.5 MB	1 MB	4 MB	4 MB	1.25 MB
Mac	Classic II	Plus	Mac II	Mac II	Mac II
System	6.x	6.0.7	6.0.7	7	7

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AppleTalk	YES	Yes	Yes	No
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Managing Your *Media*

*Having trouble locating
your graphics files?
Image-database programs
let you catalog, search for,
and retrieve photos,
illustrations, sounds,
movies, and more at the
click of a mouse.*

You've spent two hours stalking your prey through a jungle of hard disks, floppies, CD-ROMs, and SyQuest cartridges. But all you have to show for your tenacity is a headache, a looming deadline, and the same question: Do I have any pictures of giraffes? Or maybe your query has a slightly different slant: Where *is* that giraffe photo I scanned last month? In either case — rounding up all your artwork on a particular subject or unearthing a specific image from a mountain of media — you can save time, money, and aggravation by using an image-database program.

This relatively new breed of database program lets you organize and track all your graphics, no matter what their format or location. Instead of staring at cryptic filenames, you see a small representation of the image along with pertinent details such as the file type, size, and location. You can find, view, and retrieve graphics ranging from EPS illustrations to scanned photographs to QuickTime movies in minutes.

Sounds good, but are these image-database programs effective tools for managing your media? To find out, we looked at eight programs that hit the shelves in the past year (see "At a Glance").

BY AILEEN ABERNATHY

PHOTOGRAPHY: GIAMPIERO BENVENUTI



Image-Database Programs



Aldus Fetch
is a multiuser
mixed-media
database
program that
can catalog
almost anything
— as many as 64
file types in all.

What They Do

Image-database programs differ in interface, features, and performance, but the basic idea is the same: to create catalogs of all your visual media. You can quickly and easily catalog files, folders, or entire disks — up to 32,000 images or more per catalog. Under System 7, most of these programs let you catalog files by dragging their icons on top of the program's icon. As the database manager imports each item, it creates a record that contains a small low-resolution image, called a *thumbnail*, and identifying text. Each record is linked to the original image, which remains in its original location, whether on your local hard disk, a removable disk, or a network server.

No matter how large your original image is, its thumbnail and associated text take up only 3K to 30K in the catalog. (Thumbnail size depends on the program, color depth [8- or 24-bit], and compression setting.) Thus, a catalog of 100 images requires between 300K and 3 megabytes of disk space — far less than the space occupied by just one high-resolution scanned color photograph. Despite the relative svelteness of these catalogs, bear in mind that if you catalog hundreds (or thousands) of images, you'll still need a roomy hard disk.

You can view your catalog as a scrolling gallery of thumbnails or as a text list. If you tire of squinting at a thumbnail, double-clicking on it will cause most of the programs to

retrieve and display the original image (or play the original movie or sound) — without opening the source application. The database program remembers where the files are stored and, if necessary, prompts you to mount the appropriate disk or CD-ROM.

The programs' ability to let you preview the original image saves time and RAM, and it's especially handy if you don't have the application that created a particular graphic, as often happens in departments that share files. If you *do* decide to edit an image in its original application, however, most of the programs will oblige you by sublaunching the necessary application. Afterward, most of the programs update the thumbnail to reflect the changes.

You can sort and search catalogs based on a variety of criteria, including name, file type, date, and keywords. Keywords are identifying words or phrases you assign to images. They are invaluable aids in locating items, whether you want to compile a gallery of graphics on a particular subject or to locate a specific image from among thousands. For example, you might assign the keyword *animal* to all images (and movies and sounds) that contain animals. In the case of our giraffe scan, you might also attach keywords such as *Africa*, *neck*, and — of course — *giraffe*. Later, you could search on the keyword *Africa* to see a variety of images related to that continent. Or perhaps all you really need is the giraffe photo but you've

At a Glance

▶ Aldus Fetch 1.0	★★★★
CompassPoint 1.1.1	★★
Cumulus 1.1	★★★★½
ImageAccess 1.0	★★
Kudo Image Browser 1.0.4	★★
Media Cataloger 1.1	★★½
MediaTree 1.5	★★½
Multi-Ad Search 2.0	★★★★½
▶ MacUser Bottom Line pick	

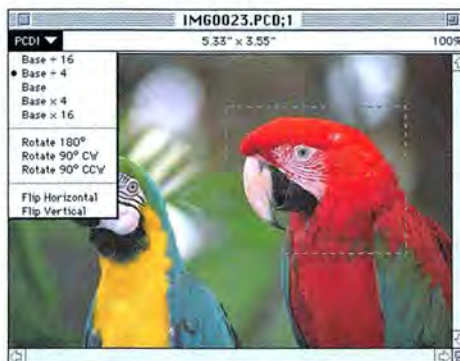


Figure 1: Aldus Fetch is the most versatile of the image-database programs we tested. Its thumbnail window identifies each image and location (left); double-clicking on a thumbnail retrieves the original file, such as this Photo CD image (right). You can zoom in or out, select another resolution, or copy the image to another program.

forgotten its filename or location. Search on the keyword *giraffe*, and all related images — including the desired one — will appear within seconds.

Most programs provide a generic text field for each image, where you can store as many as 32,000 characters of descriptive information such as the caption, location, identities of subjects, and image rights. For those who don't like lumping all the image details into a single text block, a few programs offer additional, customizable fields. If photo credits are important, for example, you can name a field Photographer. Searching for text in this user-defined field is faster than searching within the generic description field, so you can quickly locate all the photos taken by a particular photographer.

Once you've selected the right image for the project at hand, most programs let you copy and paste it into another document. (The original image gets pasted, not the thumbnail.) A few provide a more elegant solution, allowing you to send *references* — pointers to the original file — instead of entire images to programs such as Aldus PageMaker and QuarkXPress (this sometimes requires System 7). This approach is faster than copy-and-paste and requires less memory; it reduces document sizes as well, because the receiving application uses the references to create its own links to the original files. If you prefer, you can also print individual images or thumbnail catalogs.

Finally, if you work in an office in which graphics are shared, you'll be interested to note that four of these products are multiuser or client/server database programs that let several users access a catalog simultaneously over a network and allow administrators to



Sharing Images

Unless you're an MIS specialist, *file sharing* and *client/server application* may be alien terms. But these terms also apply to image-database programs that allow many people to have access to a single catalog of files somewhere on your network. Of the programs we reviewed, four boast this capability: the file-sharing applications CompassPoint, Aldus Fetch, and Multi-Ad Search and the client/server application Cumulus (CompassPoint will also be available as a client/server product shortly). All these programs allow you and your coworkers to access your image catalog simultaneously. But that's where the similarity ends.

File-sharing applications access information on a file server through standard file services such as AppleShare, or Personal File Sharing under System 7. A workgroup buys a copy of the standard software for each user. When a user requests access to a catalog, the local Mac mounts the server machine on the desktop and opens the catalog just as if it were located on the local hard disk. This approach makes sharing information easy and requires little knowledge of database operations. However, you compromise speed, because you're limited by the speed of AppleShare and the power of your own Mac as well as by the power of the server.

This is where client/server applications can make a difference. Canto's Cumulus comes in two parts: The server application provides access to several licensed users and processes all search requests and file transfers; the client software — which is stripped of any network-administration features — is for accessing the catalog remotely. Because Canto built its own server application, file sharing is not required. The server software provides logging capabilities and includes a window for monitoring database activity, something the file-sharing applications do not include. The server also responds more quickly to searches over the network, because it understands the catalog it makes and processes all searches locally, sparing you from the network overhead that comes with a file-sharing application.

How much time can you gain with client/server applications over file-sharing programs? On our Quadra 800 with a gigabyte hard drive running over Ethernet (a configuration built for speed), searches were more than twice as fast under Cumulus (two and a half seconds) than they were with CompassPoint, Fetch, or Multi-Ad Search (six seconds or more).

One last note on speed: We found cataloging a CD-ROM extremely slow, because of the limitations of CD-ROM technology. The seconds of search time gained with one application over another are inconsequential when compared with the hours it takes to catalog a single CD-ROM's worth of stock photos. It took these four database programs at least 30 minutes each to catalog 100 PICT files from 21st Century Media's PhotoDisc People and Lifestyles CD-ROM.

— Sean Safreed

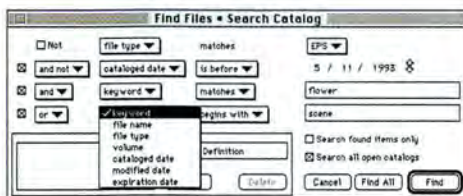
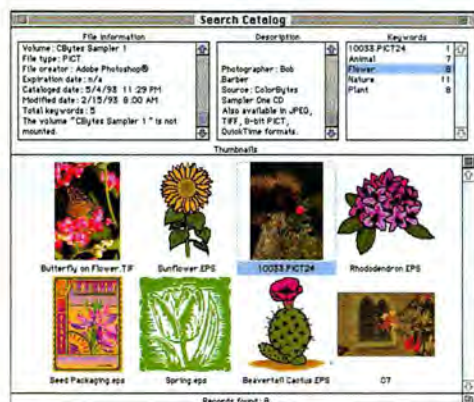


Figure 2: Multi-Ad Search displays file data in the main catalog window (left), minimizing trips to the Get Info window. When you double-click on a keyword, the program displays associated images; you can also use the robust Find Files command to track down exactly the image(s) you need (above).

Image-Database Programs

set passwords and access privileges (see the "Sharing Images" sidebar). This article focuses primarily on the programs' single-user capabilities, however.

Aldus Fetch

Aldus calls Aldus Fetch 1.0 a multiuser mixed-media database program, and, indeed, it can catalog almost anything. The program (originally Multi-Ad Search 1.0 before its acquisition by Aldus) supports 27 file types by default, and if that's not enough, you can add other Mac file types to the list — for instance, QuarkXPress, Microsoft Word, or Deneba Canvas — as many as 64 file types in all. Files in the added file types are usually displayed as document icons rather than as thumbnails, but those icons are still handy for locating and opening files.

You can select multiple images and assign keywords to them simultaneously — a tremendous time-saver — but there's a catch. Although the program generates a master list of previously assigned keywords, you can't see it or select from it when attaching those keywords to other images. Instead, you must retype the keyword when assigning it, a recipe for typos, inconsistent data entry, and incomplete searches. On the plus side, Fetch supports Apple's pnot resource, which allows it to import thumbnails, keywords, and descriptions that were attached to image files by their creators.

Fetch offers four levels of search criteria, which can be expanded through *and/or*

operators, and you can name and save frequently used search definitions. You can't locate images through searches based on dates or words in the Description field, however, and although the program is speedy for some search types, it required eight seconds to search a mere 250 images based on the search definition "Filename contains girl."

The preview features are superb (see Figure 1). You can zoom in and out when viewing large images and select any of the five Photo CD resolutions; the QuickTime controller even does loops. Once you've selected an image, movie, or sound, you can copy and paste the entire item — or a portion thereof — into another document. Fetch can also send file references instead of entire images to applications that are "Fetch-aware," a list that includes PageMaker 5.0, Multi-Ad Creator, and QuarkXPress (using a third-party XTension). This allows the receiving application to create links to the original files instead of storing the images in a document.

In the finest Aldus tradition (ahem), Fetch opens only one catalog at a time, although you can export records from one catalog and then import them to another catalog. We really like the program's PageMaker-like pasteboard, though, which lets you view selected images in isolation. Another bonus is that you can also save selected images as a "project," a tiny file that contains pointers to the original catalog, and send it to your colleagues for review.



Multi-Ad Search
lets you archive a
whopping 160,000
images or more
per catalog.
Thankfully, its
real strength
lies in its search
capabilities.



Figure 3: Cumulus is a speedy client/server database program with an elegant interface. It doesn't display preview images, but it lists more file data than other programs do. Click on the button at the top of the thumbnail, and it shows data about such elements as compression and fonts.



Figure 4: CompassPoint provides 11 user-definable fields (including check boxes) and Navitrack, which maintains a usage history for each item. Unfortunately, it also has a slow, incredibly annoying interface. Resize the window, for example, and essential elements such as control buttons get cropped out.

Multi-Ad Search

When Multi-Ad Services lost Fetch (a.k.a., Multi-Ad Search 1.0) to Aldus in 1992, it didn't throw in the towel. Instead, the company regrouped and developed Multi-Ad Search 2.0, a fast multiuser database program aimed at the graphics and publishing crowd.

Search supports fewer file formats than its predecessor, but it shares the ability to add new file types to the catalog list. You can archive a whopping 160,000 images (or more) per catalog, but we don't recommend making catalogs that large, particularly because Search can open as many as ten catalogs simultaneously. At that point, media management verges on becoming a bloated bureaucracy. However, Search also can merge catalogs and convert Fetch files into Search catalogs.

Unfortunately, Search's system for entering keywords is no better than Fetch's — in fact, it's worse, because you can't select more than one image at a time. Search also supports Apple's pnot resource, however, so when you import an image file, it also imports the keywords and descriptions that are part of it.

As you might guess from the name, Multi-Ad Search's real strength lies in its image-finding capabilities (see Figure 2). As with Fetch, you can specify as many as four search levels at once, use *not* as an operator, and save frequently used search definitions. The program can search several catalogs simultaneously, look only within records that contain previously found items, and search on dates (but not on Description text, alas). It's also fast — searching on "Filename contains girl" with 250 images took only two seconds, one-fourth the time required by Fetch.

Unfortunately, this superior search strategy doesn't extend to locating original files. Rename a file or move it to another location (say, the desktop), and Search often can't find it, even using the Find Files dialog box. Hopefully, the next version will remedy this problem by supporting the System 7 Alias Manager, as do several of the other programs in this category.

If Search does locate your original file, however, you'll see that its preview features are excellent (similar to those of Fetch), and it can send file references to Multi-Ad Creator, QuarkXPress, and PageMaker 5.0.

Cumulus

A German import from Canto Software, Cumulus 1.1 can be used by individuals, but it's first and foremost a client/server database program — and a speedy one at that. It provides the usual access privileges and security measures for network use, plus the options of keeping a log of database activities and of copying image files to a central folder.

In our tests, Cumulus skipped numerous files during the cataloging process, claiming they had already been cataloged. Turns out that the program uses creation dates to find out whether or not to catalog a file and modification dates to identify different versions of the same file. If two files have the same dates, as is often the case with CD-ROM image collections, the program assumes they're the same. You can tell it not to skip already cataloged files; of course, this also causes it to reimport images that actually *are* in the catalog.



***Cumulus is
a speedy
client/server
database program
with the fastest
search engine
of those tested.***

But Wait, There's More



At press time, Eastman Kodak released Shoobox (\$345), an image-database program optimized for handling Photo CD files (it also supports other Mac formats). The feature set resembles that of Aldus Fetch, but Shoobox also provides more than 100 user-definable data fields plus the best setup we've seen for entering keywords and text data. It's the first program that lets you customize thumbnails' size and background color, and you can reorder thumbnails simply by dragging them. You can also mark images and view them as subsets of the catalog or save them as project files (à la Fetch). Eastman Kodak Co., 343 State Street, Rochester, NY 14650; 800-242-2424 or 716-724-4000.

Also watch for Graphics Tools (\$169.95), a suite of utilities for managing multimedia and graphics files on the Mac and machines running Windows. A key component is Media Manager, a basic image-database program; other modules will handle file-format conversion, image processing, screen capture, and compression. DeltaPoint, 2 Harris Court, Suite B-1, Monterey, CA 93940; 408-648-4000.

If you're looking for a client/server database program, you have more options than Cumulus. Two companies offer client/server database programs that you can customize to your company's needs, and both, like Northpoint's CompassPoint, are based on 4th Dimension. Digital Album (single-user version, \$485) is primarily a PC product and supports only TIFF, PICT, and JPEG files. But it does let Mac and PC users share catalogs over a network. The Library of Congress has used Digital Album as part of its "library without walls" pilot program, which exchanges images with universities over a fiber-optic link. GTE ImageSpan, One Stamford Forum, Stamford, CT 06904; 203-965-2525.

Thumbs Up (single-user version, \$495) was originally created for the art department at Duke University. It currently catalogs only JPEG files, but soon it will support EPS and TIFF as well. Graphic Detail, 4020 West Chase Blvd., Suite 500, Raleigh, NC 27607; 800-234-8635 or 919-833-3366.

— Aileen Abernathy

Image-Database Programs



CompassPoint's two strengths are a unique image-tracking system and 11 user-definable fields that you can label however you like.

Cumulus' approach to keywords is better than that of most programs. Although you must apply keywords to each image individually, you can select them directly from the master list — albeit only one at a time. Furthermore, you can import keywords from text files, edit the master list, and even choose to have specific keywords and descriptions attached to images as you catalog them — a tremendous time-saver.

The image records also contain a Status field, which has a pop-up menu of user-defined terms, and a File Type window, accessed by clicking on a small button at the top of the thumbnail, which displays format-specific information such as names of the fonts and the named colors contained in an EPS image. The database stores all image information (unlike Fetch and Multi-Ad Search), so that the program doesn't have to retrieve original files to display data such as file size and dimensions (see Figure 3).

Cumulus supplies only a single search level, but you can search on all fields, including the Status and descriptive Notes fields, and pick keywords from a pop-up master list. The search engine is the fastest of all the programs', although our joy was tempered by a bug that prevented the *contains* operator from working most of the time.

The program's biggest drawback is its lack of image previews. This forces you to open the creating application (assuming that you have it) both to see a full-sized graphic and to copy it for placement in another document. However, Cumulus does come with a Photoshop plug-in and a QuarkXPress XTension, which allow you to access the catalog from within those programs and select and import images.

CompassPoint

CompassPoint 1.1.1, from Northpoint Software, has two strong points: image tracking and user-definable fields. Its unique Navitrack system automatically records where and when each image has been used and who borrowed it. This is a helpful feature if you want to avoid reusing images in the same publications or need to track down who has a particular graphic.

The program also provides the most data-entry fields of any of these programs — all of them searchable — including 11 fields (check boxes too) that you can label and use however you like (see Figure 4). A special Restrictions field lets you flag any limitations on the use of an image.

Unfortunately, it's all downhill from there. The same technology that makes possible all those data-entry fields — the underlying ACI US 4th Dimension database manager — is responsible for CompassPoint's last-place finish in other respects. It was the slowest database program in our tests and also has the largest files, heftiest price tag, and most annoying interface.

It's the only multiuser database program we reviewed that forces single users to enter a password every time they open a catalog. The catalog window fills the screen of a 13-inch monitor; if you resize the window, the program crops out the control buttons and scroll bars. On the input side, CompassPoint supports only four file types, it didn't generate thumbnails for several images in our tests, and it doesn't record any image data besides filename and type.

CompassPoint, like Cumulus, forces you to open an editing application to view or copy original images. It compounds the problem by forcing you through a Navitrack dialog



Figure 5: ImageAccess lets you choose via pop-up menus what information to show in list views. Disk icons indicate whether source volumes are mounted and if images have been modified since they were cataloged (left). Thumbnails appear only in the InfoSheet window, but it doesn't show file size and other details (right). ImageAccess doesn't have true keyword search, but we added our own "keyword" field.

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Image-Database Programs

box to check out the image or movie, even if all you want to do is *look* at it.

In short, CompassPoint might be useful for libraries, museums, and other organizations that need to meticulously track an image library; otherwise, the program doesn't have much to recommend it.

ImageAccess

As might be expected for a product from Nikon Electronic Imaging, ImageAccess 1.0 is aimed primarily at companies with large slide collections they want to archive. Accordingly, it supports only a few file types, but you can scan images directly into the catalog, using a Nikon slide scanner. With the scanner's auto-feeder accessory, the program can catalog 300 slides unattended in a single session.

This is the only database program other than CompassPoint that offers user-definable fields. You can label the seven fields to record data about photographers, rights, image numbering, and so forth. You can search on text in fields, but not on keywords; the program has no keyword-search capability. You can specify as many levels of search criteria as you need, but all search criteria must be connected by *and*, because the program has no *or* operator.

ImageAccess sports a great-looking high-tech interface, but the program performs sluggishly and has some oddities. Unlike the other programs, for example, it doesn't show you a thumbnail when you select a file in the list view. The InfoSheet window doesn't show file details (dimensions, file size, or dates), although there's a conveniently vacant space for them (see Figure 5). To see this data, you must hold down the mouse button while the cursor is over the filename. A windoid then appears with the additional

information and disappears again as soon as you release the button.

Using pop-up menus, you can organize list views to display whatever information you want — a nice touch. But the program's sorting feature needs work; it's agonizingly slow and is based entirely on the field that's displayed in the first column of the list view.

ImageAccess lets you preview images individually or evaluate a group via its slide-show feature, which is also handy for doing impromptu presentations. Once you've selected an image in the slide show, however, you're at a dead end, because the program doesn't let you copy images to other programs and it can't open an editing application.

Kudo Image Browser

If you're a person who "knows it when you see it," you'll love the Riffle control in Kudo Image Browser 1.0.4, from Impace Systems. Press the button at the lower right of the catalog window, and the closest thumbnail becomes a fast-moving slide show, flipping backward or forward through your catalog at speeds of up to ten frames per second.

After locating the image you want, you can select the thumbnail and drag it into an open PageMaker or QuarkXPress layout. Kudo Image Browser finds the original image and places it in the document. Too cool. This drag-and-place feature requires System 7, and the image must be in a file format that the layout applications accept. (For example, neither PageMaker nor QuarkXPress supports native Photoshop files.)

Aside from these standout features, Kudo Image Browser is a fairly limited product (see Figure 6). It stores very little file data, and its Notes field holds a meager 1,024 characters. You can't even edit notes in an



Designed for archiving large slide collections, ImageAccess sports a high-tech interface with pop-up menus to organize list information.



Figure 6: Kudo Image Browser offers a clever drag-and-place capability as well as a nifty Riffle button (lower right) for fast visual searches. The rest of the program is pretty bare-bones, providing little file data and a Notes field that holds only 1,024 characters.

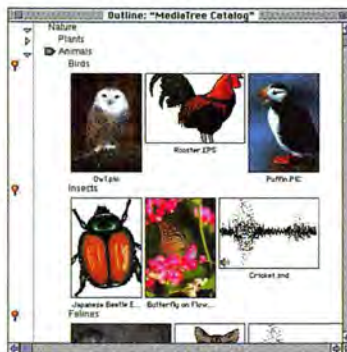


Figure 7: MediaTree lets you organize images hierarchically by attaching them to topics in a text-based outline. Copying images from the main catalog to an outline is slow and cumbersome, however, and the program's thumbnails frequently crop out parts of images (note the almost decapitated rooster).

Image-Database Programs



**When you drag
a thumbnail into
a page layout,
Kudo Image
Browser finds
the original image
and places it in
the document.
Too cool.**

image's Info view, the usual approach; it's permitted only in the program's list view.

You can't create keywords either, and the program provides only rudimentary search capabilities (you can search on the Notes field, though). But the most amazing — and serious — drawback is that Kudo Image Browser doesn't let you catalog individual files, only entire folders or disks.

Kudo Image Browser does support a wide range of default file types (second in number only to Aldus Fetch), through its use of Claris XTND translators. XTND-aware applications can share translators, and we were able to catalog Paint files (normally an unsupported format), because a MacPaint translator file (from Media Cataloger) was in the Claris folder of our test machine. Kudo Image Browser is also the only program other than Fetch that supports the Photo CD format; however, it catalogs only the Base resolution (512 x 768 pixels).

MediaTree

The emphasis of MediaTree 1.5, from Tulip Software, is on organizing data hierarchically and helping you prepare presentations. To that end, it offers a novel Outline view that lets you attach images to topics in a text-based outline (see Figure 7). You attach images to outline topics by copying and pasting them from the main catalog, a process that highlights one of the many flaws of the program: It's agonizingly slow.

MediaTree can catalog some unusual file types, including ASCII text files, the contents of the Clipboard, and sounds and PICT images contained in a file's resource fork. It supports Photoshop plug-ins, allowing you to bring scanned images and video frames directly into the program; you also can record sounds and save them as catalog items.

The program organizes its file types into Picture, Sound, Movie, and Text. Because all the graphics files are lumped under Picture, you can't sort or search based on EPS or TIFF. In fact, the sorting options are limited to filename and date cataloged and the multi-level search dialog box has a bug that causes it to arbitrarily replace your choice of an operator (say, *contains*) with its own (perhaps *starts with*).

Unfortunately, MediaTree harbors several other bugs as well as a confusing, cluttered interface that consists of eight overlapping

windows. It's not always clear how to do things, such as adding keywords. As it turns out, the program generates keywords automatically from the text you enter in an image's description field. The result is a huge list full of irrelevant words such as *but* and *your*.

MediaTree has other annoyances too numerous to list. For example, it doesn't properly scale EPS images to fit the thumbnail space, so the outside edges are often cut off. In the case of one horizontal image we cataloged, more than two-thirds was missing from the thumbnail.

On a more positive note, under System 7, MediaTree has a clever Open in Application command that lets you open or place images directly into several other programs. By default, MediaTree will export images to PageMaker, Photoshop, Microsoft Word, and TeachText, but you can add other applications to the list as well.

Media Cataloger

Media Cataloger 1.1, from Interactive Media, is the ideal product for minimalists: least expensive (\$150 less than the closest competition), smallest file sizes (amazingly small, in fact), smallest memory requirement (for reasonable performance), simplest interface, and most-limited functionality.

Originally designed as a companion product for Special Delivery, Interactive Media's multimedia authoring tool, Media Cataloger has some similarities to MediaTree. It too organizes catalog items into Picture, Sound, Movie, and Text categories, and it can catalog items from the Clipboard and a file's resource fork. The two programs share one



Figure 8: Media Cataloger is a no-frills program that does most of its work in three small windows. It provides no text-entry fields but offers surprising support for keywords, allowing you to select several at once and search on them or assign them to images.

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Image-Database Programs



***Media Cataloger
is the ideal
product for
minimalists: least
expensive,
smallest file sizes,
simplest interface,
and most-limited
functionality.***

shortcut we wish other developers would adopt: You can jump to a cataloged image by typing the first letters of its name.

Media Cataloger's interface is superior to MediaTree's — easier and faster to use and much more stable. Three small windows contain most of the features (see Figure 8) — not that there's much to do. You have only two ways to search the catalog: by turning one or more of the four object types off (or on) or by searching on keywords (you can search on multiple keywords simultaneously). The program lets you preview an item by double-clicking on it, but it can't launch an editing application.

With no text-entry fields whatsoever, you're out of luck if you want to record any image details. We were surprised to find, however, that Media Cataloger has one of the best systems for assigning keywords to images. You can select multiple images and apply multiple keywords to them simultaneously, either by typing in new words or by selecting them from the keyword list (or both).

Like Kudo Image Browser, Media Cataloger implements its file support with Claris XTND translators. It claims to support Photo CD (as does MediaTree), but it's really only using the existing capabilities of QuickTime 1.5 and the Apple Photo Access extension to import PICT versions of the images on a Photo CD disc — something any of the database programs can do.

The Bottom Line

Image-database programs are an emerging product category, and none of the products in this review is an unqualified success — yet. Most are in their first version, and the developers are still working out the kinks. Whereas each program has its Achilles' heel (or two), the weakest link overall is data entry. None of the programs currently has adequate facilities for entering keywords and text descriptions, the most time-consuming part of building a truly useful database, but watch out for Eastman Kodak's Shoebox (See the "But Wait, There's More" sidebar).

That said, there are some clear winners and losers. We suggest that you steer clear of CompassPoint and MediaTree; they are slow and buggy and have unwieldy interfaces. Kudo Image Browser and ImageAccess have a few nice features and are worth a look, but you may find them overpriced for their limited

capabilities. Media Cataloger is the bargain-basement alternative, an option only if your pocketbook and hard disk are modest in size.

Our three top choices — Aldus Fetch, Multi-Ad Search, and Cumulus — all have features to recommend them, including network capabilities for multiple users and direct links to page-layout programs. Depending on your needs, any of them can be a good choice. Our nod goes to Fetch, however, because it's the most versatile and complete of the programs tested. It handles the widest variety of formats, offers many novel (yet practical) features, and has loads of time-saving shortcuts. Simply put, Fetch is fun to use (love that spinning dog-bone icon instead of the wristwatch!), and that's no small consideration for a database program.

Free-lance writer Aileen Abernathy is still entering keywords for the 20,000 images in her collection.

Handy Thumbnails



Using an image-cataloging application is one way to keep track of your pictures, but this month ZiffNet/Mac presents an alternative method that lets you view your image collection without leaving the desktop. This month's *MacUser* utility, Thumbnail, is a System 7 drag-and-drop utility that turns the Finder icon of a graphics file into a miniature rendition of the file's contents. These thumbnail previews show you the document image at a glance, so you can use the Finder as your image cataloger.

Although some graphics and multimedia applications, notably Adobe Photoshop, can also save files with this kind of image icon, Thumbnail lets you quickly and easily perform this operation on all of your graphics files. It can decipher almost any file format, including PICT, TIFF, JPEG, CompuServe GIF, and PostScript EPSF (with a PICT preview); it can also create an icon based on the poster frame of a QuickTime movie. You can process multiple files simultaneously, or process an entire folder or volume, simply by dragging them onto the Thumbnail application.

Created by programmer Robert Mah, author of May's *MacUser* utility WindowRanger, Thumbnail is available only on ZiffNet/Mac and under the ZiffNet Selections icon on AppleLink. See this issue's ZiffNet/Mac page for information on downloading Thumbnail free of connect-time charges.

— Mark Simmons

continues ►

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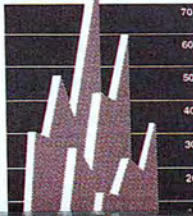


Image-Database Programs

Table 1: Features of Image-Database Programs

● = yes ○ = no	► Aldus Fetch 1.0 ■■■■	CompassPoint 1.1.1 ■■	Cumulus 1.1 ■■■½	ImageAccess 1.0 ■■■
List price (single-user version)	\$295	\$749	\$295	\$495
Pros	Multiuser. Great feature set. Catalogs the most file formats and lets you add new ones. Supports pnot resource. Can save search criteria. Small file sizes.	Multiuser; client/server version available soon. User-definable fields. Navitrack feature records image usage. Can search on any field.	Client/server database program. Fast. Stores lots of file data. Good keyword support. Pop-up Status field.	User-definable fields. Unlimited search criteria. Scans slides directly into catalog. Slide-show feature.
Cons	Can't search on dates or text field. Poor keyword support.	Expensive. Slow. Huge files. Supports few file types. Frustrating interface. Password required. Can't preview or copy images. No keywords.	Sometimes skips files during cataloging. Can't preview images. Bug in Search command.	Expensive. Supports only a few file types. Can't copy images or open editing program. No keywords. No printing.
File types supported	EPS, Gallery Effects, JPEG, Multi-Ad Creator, Paint, Persuasion, Photo CD, Photoshop, PICS, PICT, QuickTime, RIFF, sound, System 7 editions, TIFF	EPS, PICT, QuickTime, TIFF	EPS, FreeHand, JPEG, Paint, Photoshop, PICS, PICT, QuickTime, TIFF	EPS, JPEG, Photoshop, PICT, TIFF
Features				
Max. no. of images per catalog*	32,000	50,000	50,000	32,000
Catalog size for 100 images	700K	3,200K	1,400K	1,100K
Drag-and-drop cataloging (System 7)	●	○	●	○
Skips already-cataloged images	●	○	●	○
Opens multiple catalogs	○	○	●	○
Previews original image	●	○	○	●
Plays movies and sounds	●	○†	○†	NA
Supports keywords	●	○	●	○
Has notes field (max. characters)	32,000	32,000	32,000	32,000
Has user-definable fields	○	●	○	●
Does multilevel searches	●	○	○	●
Searches text fields	○	●	●	●
Finds moved/renamed files	●	○	●	○
Opens editing application	●	●	●	○
Updates records for edited images	●	●	●	●
Copies images to Clipboard	●	○	○	○
Has direct links to applications	Multi-Ad Creator, PageMaker 5.0, QuarkXPress	○	Photoshop, QuarkXPress, RagTime	○
Prints	●	●	●	○
Company	Aldus Corp. 411 First Ave. S. Seattle, WA 98104 206-628-2320 206-343-3360 (fax)	Northpoint Software 2200 W. Eleven Mile Rd. Berkley, MI 48072 313-543-1770 313-541-1858 (fax)	Canto Software 800 Duboce Ave. San Francisco, CA 94117 800-332-2686 415-431-6871 415-861-6827 (fax)	Nikon Electronic Imaging 1300 Walt Whitman Rd. Melville, NY 11747 800-526-4566 516-547-4355 516-547-0305 (fax)

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†Must sublaunch original application.

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Image-Database Programs

Table 1: Features of Image-Database Programs, continued

	Kudo Image Browser 1.0.4 ⚬⚬⚬	Media Cataloger 1.1 ⚬⚬½	MediaTree 1.5 ⚬½	Multi-Ad Search 2.0 ⚬⚬⚬½
List price (single-user version)	\$295	\$99	\$248	\$249
Pros	Riffle control provides fast visual searches. Lets users drag and place images into page layouts. Supports variety of file formats.	Inexpensive. Fast. Smallest catalog files. Low memory requirement. Good keyword support.	Built-in outliner. Supports Photoshop scanner drivers. Direct link to PageMaker. Small file sizes. Catalogs text files.	Multiuser. Fast. Excellent search capabilities. Lets you add new file types. Supports pnot resource.
Cons	Can't catalog individual files. Tiny text-entry field. Simple searches only. No keywords. No text-list view. Large file sizes.	No text-entry fields. Doesn't distinguish graphics formats. Limited search capabilities. Can't open editing program. No text-list view.	Slow. Buggy. Confusing interface. Doesn't distinguish graphics formats. Poor keyword support.	Can't search text field. Poor keyword support.
File types supported	BMP, EPS, FreeHand, GIF, PCX, Photo CD, Photoshop, PICS, PICT, QuarkXPress, QuickTime, Scitex CT, sound, TGA, TIFF	EPS, Paint, Photoshop, PICT, QuickTime, resource forks, sound, text, TIFF	Clipboard, EPS, GIF, Paint, Photoshop, PICT, QuickTime, resource forks, RIFF, sound, text, TIFF	EPS, gray-scale RIFF, JPEG, Multi-Ad Creator, Paint, PICT, TIFF
Features				
Max. no. of images per catalog*	32,000	32,000	32,000	160,000
Catalog size for 100 images	1,600K	300K	600K	900K
Drag-and-drop cataloging (System 7)	●	○	●	●
Skips already-cataloged images	●	●	○	●
Opens multiple catalogs	●	●	○	●
Previews original image	●	●	●	●
Plays movies and sounds	○†	●	●	NA
Supports keywords	○	●	●	●
Has notes field (max. characters)	1,024	NA	32,000	32,000
Has user-definable fields	○	○	○	○
Does multilevel searches	○	○	●	●
Searches text fields	●	NA	●	○
Finds moved/renamed files	○	●	●	○
Opens editing application	●	○	●	●
Updates records for edited images	●	○	○	●
Copies images to Clipboard	●	●	●	●
Has direct links to applications	PageMaker, QuarkXPress	○	Microsoft Word, PageMaker, Photoshop, TeachText	Multi-Ad Creator, PageMaker 5.0, QuarkXPress
Prints	●	●	●	●
Company	Imspace Systems Corp. 4747 Morena Blvd., Ste. 360 San Diego, CA 92117 800-488-5836 619-272-2600 619-272-4292 (fax)	Interactive Media Corp. P.O. Box 0089 Los Altos, CA 94023 415-948-0745	Tulip Software P.O. Box 3046 Andover, MA 01810 800-972-9659 508-475-8711	Multi-Ad Services, Inc. 1720 W. Detweiller Dr. Peoria, IL 61615 800-447-1950 309-692-1530 309-692-5444 (fax)

*This is the practical limit suggested by the company. In many cases, the catalog size is limited only by disk space.

†Must sublaunch original application.

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sounds scary,
imagine the
alternative.***

BY SHELLY BRISBIN

Backing up all the Macs in your office used to be a simple proposition: You handed every employee a box of floppy disks and let them click and drag the files they wanted to protect at their individual machines. But that was before networks were in place, before Mac hard-disk capacities got so large, before file and e-mail servers became staples in many offices. Today, you need to back up many megabytes of data, and that fistful of floppies just doesn't cut it. To protect your valuable data and make sure those backups get done, you need a high-capacity tape drive and a software interface — a network-backup system.

Network-Backup Software

Tape drives were made for backup. They're fast, they're reliable, and they're relatively inexpensive. DAT (digital audiotape) is the most popular tape medium available to Mac users, and DAT drives can be had for around \$1,500. At \$20 for a 90-meter tape, you can back up twenty-five 80-megabyte hard disks for less than \$1 each — and the deal gets even sweeter if your tape drives support compression.

But that tape drive won't do you much good without backup software. That's because tape cartridges are not Finder-mountable volumes. Unlike with hard and floppy disks and removable cartridges, there's no tape icon on the Mac's desktop — you can't double-click on an icon or use the Finder to copy files between a

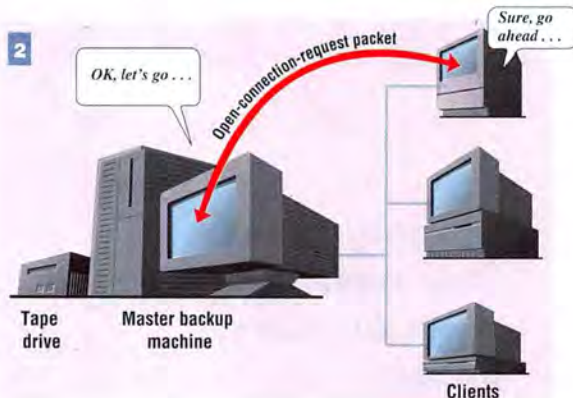
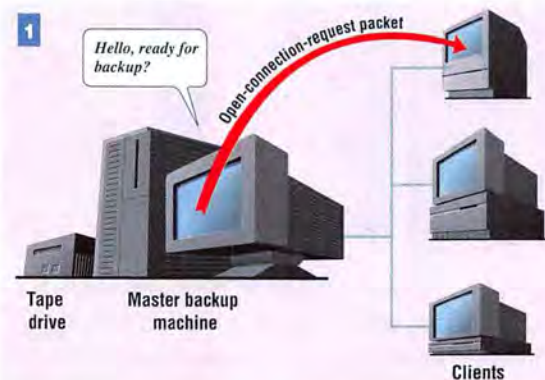
tape cartridge and a Mac's hard disk. More important, backup software lets you plan backups and have them execute automatically. The best software makes network backup almost effortless.

The four network-backup software products we tested each provide a measure of automation for backup. Under ideal conditions, you simply connect a SCSI tape drive to your master backup Mac, install a control panel on each *client* machine (each Mac to be backed up on the network), and configure the network-backup software on the master backup machine. Each client Mac uses Apple's ADSP (AppleTalk Data Stream Protocol) to communicate with the master machine (see the "How It Works" sidebar).

Two Roads to Travel

Network backup can be *administrator-oriented* or *user-oriented*. Administrator-oriented means that the procedure is centrally managed, scheduled, and maintained by an administrator. With a user-oriented approach, individual users can enjoy the benefits of centralized storage while controlling some of the backup functions themselves. Of the four packages ZD Labs tested for *MacUser*, two — Dantz Development's Retrospect Remote 2.0 and Tecmar's QTBackup 3.02/QTShare 1.1 — are administrator-oriented and two — PCPC's NetStream 2.1.1 and Memorybank's Memorybank Software 4.2 — are user-oriented. In all four cases, a master backup Mac runs the administration software and is

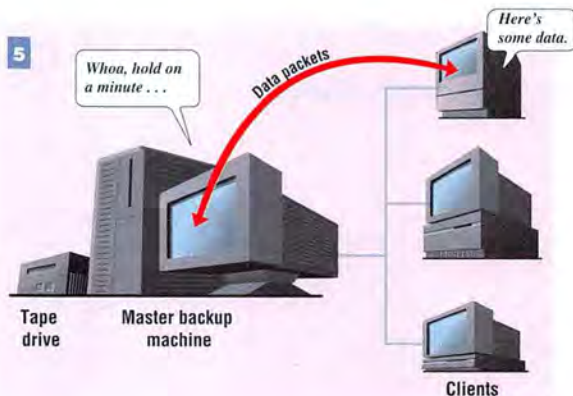
How It Works



All four network-backup products use ADSP (AppleTalk Data Stream Protocol) to move data between each of the client Macs and the master backup machine.

ADSP is a full-duplex session protocol, which means that it lets two networked Macs send and receive data simultaneously, once a connection has been opened. Besides being used by network-backup applications, ADSP is used by terminal-emulation programs, network-management applications, and workgroup software for moving information among lots of Macs.

ADSP is built in to System 7. If your network contains System 6 Macs, you'll need to run Apple's Network Installer 1.3.2 to add the current version of AppleTalk (58.0.2 at press time) to each machine. Then drop the ADSP INIT into each System Folder.



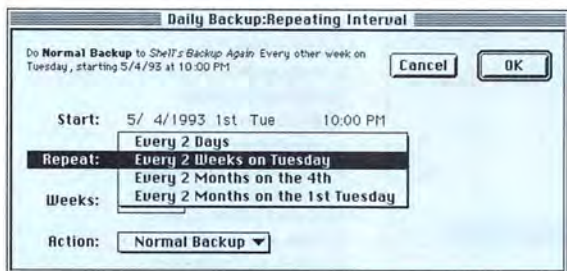


Figure 1: Within a simple dialog box, Retrospect Remote offers great flexibility in scheduling.

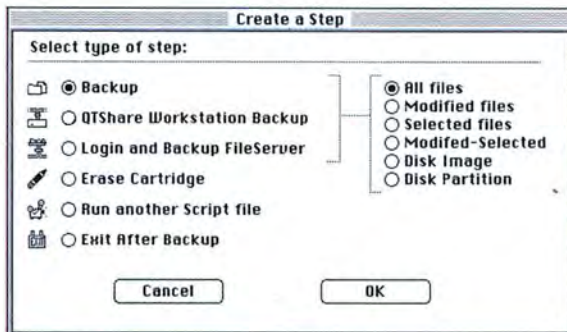
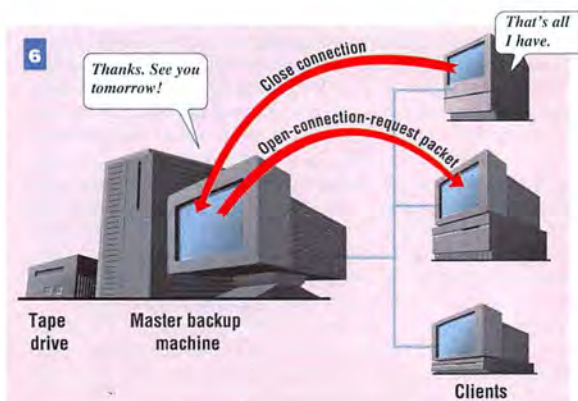
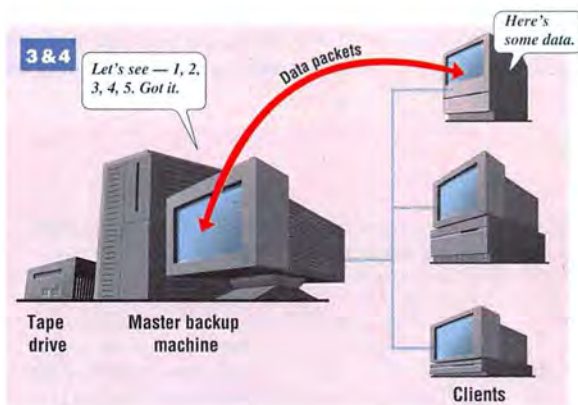


Figure 2: QTBBackp's interface is good. This dialog box lets you create *steps*, which you combine to form a QTBBackp script. Like others in the application, this dialog box is uncluttered and presents a variety of options.

You can back up twenty-five 80-megabyte hard disks for less than \$1 each — if your tape drives support compression, the deal's even sweeter.



How a network backup works:

- 1 Looks for a connection.** The administrator software, loaded on the master backup machine, tries to establish a connection with other Macs on the network. It creates a *connection end* on the backup machine. Then ADSP sends an *open-connection-request packet* to the first client Mac scheduled for backup. This *control packet* — a packet containing instructions rather than backup data — has the parameters a client needs to communicate with the master backup machine.
- 2 Establishes a connection.** When a client receives the backup machine's connection request, it responds with its own *open-connection-request packet*. When the backup machine confirms reception of this, a connection is opened between the two.
- 3 Sequences data.** ADSP identifies each byte of information with a 32-bit sequence number to make sure data moves sequentially between the client and the backup machine. These bytes move across the network in the form of *data packets*. Each data packet can contain as much as 572 bytes.
- 4 Sequences packets.** ADSP tracks each packet to make sure it is sent and received in the correct order. The sending machine identifies the packet by number, which the receiving machine compares with its list of packets to make sure everything's progressing without error. If the numbers don't match, ADSP discards the packet and tries again.
- 5 Controls flow.** To make sure the backup machine is not overwhelmed with data from the client Mac, ADSP tells the sending machine how much space is available in the receiving machine's data buffer. It regulates the sending speed to make sure the receiver can handle all the information being sent.
- 6 Closes the connection.** When a backup is finished or if an error occurs, ADSP breaks the connection. Backup applications work with one client at a time, and when one ADSP connection is closed, the master backup machine looks for the next client Mac on its backup list.

— Shelly Brisbin

Network-Backup Software

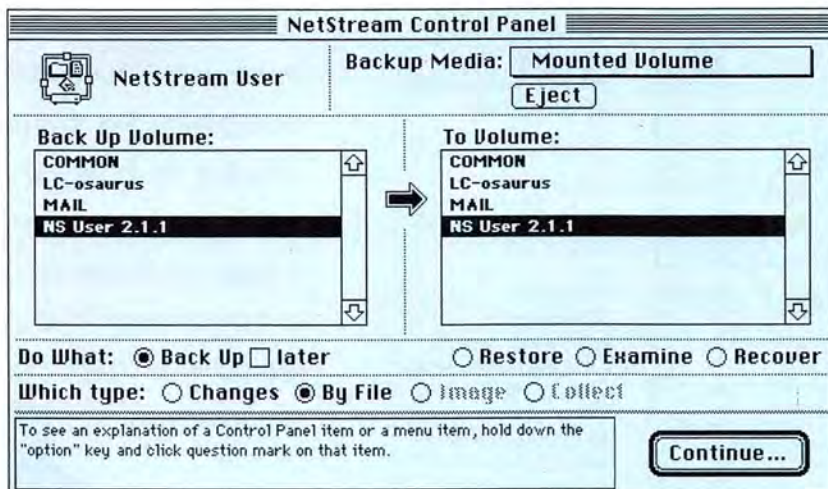


Figure 3: NetStream's Control Panel (an unfortunately named screen within the application, not a system-level control panel) is complicated. It's ambiguous where this and other dialog boxes are leading, and the functions of many buttons are unclear unless you use the help feature.

connected to the tape drive on which files are stored once they've been backed up.

When choosing among these products, it's important to understand your backup needs. Are people in your office comfortable with undertaking some management of their own backups, or do they prefer the certainty of an administrator who takes care of

the details? Can users make decisions about what should be backed up? Will they take the initiative? If not, an administrator-oriented backup approach is best. If, on the other hand, users feel a personal stake in backing up and are faithful to the task, you might choose a user-oriented product. Workgroup backup is a variant of the user-oriented approach.

Using System 7 file sharing and one of the seven simple backup products we surveyed, small groups can perform their own backups (see the "Backup for the Rest of Us" sidebar).

Bundle of Joy

When you decide to implement network backup, consider the available bundling options and their limitations.

Backup for the Rest of Us

You might not think of a few Macs connected for the purposes of printing and limited file exchange as a network. You might not have the budget for tape drives and high-powered backup software. Backing up, however, is still important for small offices and workgroups of fewer than ten Macs. And you can do it by using a small network and System 7's built-in file-sharing capability.

We examined seven inexpensive backup-software packages that are most often used by individuals, and we used file sharing to adapt them to the needs of small groups of users. With budget constraints in mind, we evaluated the programs' interfaces and ran backup-speed tests with an optical-disc drive connected to a master backup machine. You can find optical drives that cost about the same as DAT (digital audio-tape) drives, and their ability to do double-duty — as backup devices and as portable, Finder-mountable storage devices — make them an excellent choice for the cost-conscious.

Using file sharing as a backup transport system requires users to play an active role in the backup process: The backup medium must be mounted on a user's desktop via file sharing. Although some workgroup backup packages have scripting and limited scheduling functions, they are not truly automated, which makes workgroup backup somewhat more cumbersome than large-network backup. Like those working with user-oriented network-backup packages, workgroup members need to become disciplined enough to initiate backups on their own.

Diversified I/O's SoftBackup II 4.22 has nearly all the desirable

features of a workgroup backup program — an elegant interface, fast speed, and sophisticated features made it our favorite workgroup option. Like the big-league network packages, SoftBackup II provides scripting and scheduling and saves each generation of modified files rather than overwriting (and destroying) earlier versions. This feature is a given among network-backup packages but is missing from several of the workgroup applications we tested, probably because the programs are often used with floppy disks, where maintaining catalogs of generational backups across disks is impractical.

SoftBackup II is the only workgroup program we found that is capable of scripting backups of multiple Macs simultaneously on the same storage device. Its \$149 price is higher than that of most of the other products in this category, but you get what you pay for.

Although we found that several of the products contain minor bugs, our biggest headaches came while testing Broad Ripple Systems' Late Night Attendant 2.0, which had the dangerous habit of overwriting files or folders with duplicate names, even if they had different attributes and appeared on different nodes. For example, Late Night Attendant saved only one System Folder — the last one modified — when four machines were backed up. Broad Ripple's unresponsive technical support added insult to injury.

We also cannot recommend Fifth Generation's Fastback Plus 3.0, despite bug-free performance and strong tech support. An arcane interface and overly technical documentation make the no-frills program more trouble than it's worth.

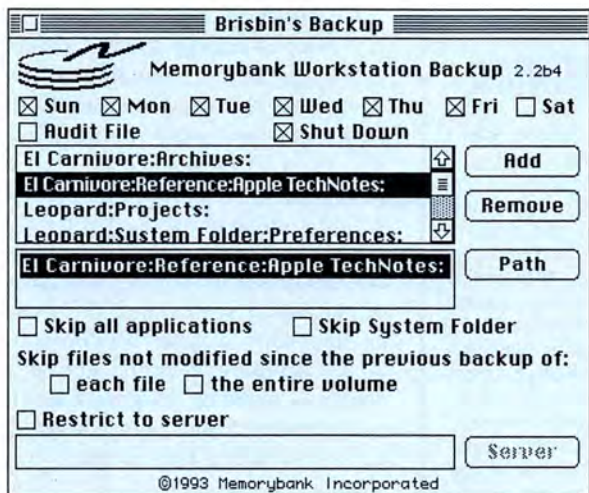


Figure 4: Selecting folders for backup with Memorybank Software's client application requires you to choose or edit directory pathnames in the software's cluttered dialog box.

Several tape-drive vendors bundle Retrospect (a single-user version) or Retrospect Remote with their systems.



You can buy your software and tape drive separately or as a bundled package.

Retrospect Remote and NetStream are compatible with tape, optical-disc, and removable-cartridge drives from a variety of manufacturers. Several tape-drive vendors bundle Retrospect (a single-user version) or Retrospect Remote with their systems.

Dantz sells 10- and 50-user packs of the Retrospect control panel, which can be used with Retrospect to provide a network-backup system. PCPC also sells multiuser packs for its NetStream software.

Tecmar bundles QTBackup and QTShare (the control panel that lets QTBackup work with clients over a network) with its DataVault 4000

Golden Triangle's SnapBack 1.4 has features and ease of use that could make it a top-notch workgroup product, but a bug in the setup program causes a "Format Failure" error when you try to format a new backup disk. We solved the problem by holding down the Command key while choosing the Format option, as suggested by Golden Triangle technical support. Unless you know the workaround, there is no way to format a

disk for backup. SnapBack was also incompatible with the MicroTech optical drive we used for testing and displayed frustrating error messages when we switched to a Sony SMO-5501 drive. We corrected this problem with a call to tech support.

ASD's FileDuo 1.0.1, Dantz Development's DiskFit Pro 1.1, and Surf City's SurfGuard 2.24 are all good single-user backup products that can be used with file sharing. We think you'll find SoftBackup II a better alternative, however.

DiskFit Pro, Dantz Development Corp., 1400 Shattuck Avenue, Suite 1, Berkeley, CA 94709; 510-849-0293. Version 1.1. \$125.

Fastback Plus, Fifth Generation Systems, Inc., 10049 N. Reiger Road, Baton Rouge, LA 70809; 800-873-4384 or 504-291-7221. Version 3.0. \$189.

FileDuo, ASD Software, Inc., 4650 Arrow Highway, Suite E-6, Montclair, CA 91763; 909-624-2594. Version 1.0.1. \$149.

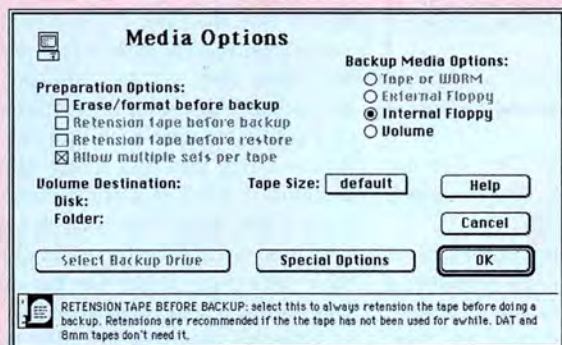
Late Night Attendant, Broad Ripple Systems, Inc., 2902 N. Meridian Street, Indianapolis, IN 46208; 317-923-2194. Version 2.0. \$89 per user.

SnapBack, Golden Triangle Computers, Inc., 4849 Ronson Court, San Diego, CA 92111; 800-326-1858 or 619-279-2100. Version 1.4. \$129 (server/three users).

SoftBackup II, Diversified I/O, P.O. Box 390876, Mountain View, CA 94039; 415-961-5933. Version 4.22. \$149.95.

SurfGuard, Surf City Software, 8144 E. Woodwind Avenue, Orange, CA 92669; 714-289-8543. Version 2.24. \$150.

— Jim Shatz-Akin



Diversified I/O's SoftBackup II stands out among workgroup backup packages, because it's packed with useful features, including good scripting ability.



How We Tested Network-Backup Software

ZD Labs tested these network-backup products in a real-world setting, duplicating the kinds of situations most often found in workgroup and departmental environments. First, we put together a 19-node Ethernet network consisting of 16 Mac workstations, an AppleShare 3.0 file server, a QuickMail server, and a master backup machine. The Mac models included Quadra 950s, Quadra 700s, Ili's, and an LC. The workstations were divided into two groups: one to resemble Mac configurations preferred for graphics use and one preferred for business. We loaded 4 machines with graphics-design and page-layout applications, QuickTime movies, and large graphics files. The 12 business Macs contained spreadsheet, word-processing, and database files and applications. The differences in configuration provided a wide variety of sizes and numbers of files.

Memorybank Software and QTBackup/QTShare come bundled with a tape drive, so we used their respective devices to test the software. To test NetStream and Retrospect Remote, we used an Archive Python DAT drive, supplied by APS Technologies. We disabled hardware compression to eliminate the impact of tape-drive differences on our test results. We connected the tape drives to the master backup machine, which ran the software being tested.

ZD Labs tested each product's backup and restore capabilities as well as the software's robustness under demanding conditions. In each case, we repeated the tests to arrive at average timings. First, we backed up the entire network. After making changes to files and folders on all the user machines, we performed three sets of incremental backups. This process tested each product's ability to use catalog data to distinguish among files to back up. Backup testing

concluded with two single-folder backups, designed to test how easy it is to script and run customized backups.

We also performed several restore tests. First, we erased and restored the AppleShare server's hard disk, and then we erased that of a single Mac on the network, to measure the ease, speed, and accuracy with which each product restored crashed hard disks. Next, we performed restore tests seeking the most recently backed-up version of a particular folder that we had previously deleted. Restore testing concluded with a single-file-restore test, designed to restore any version of a trashed file but *not* specifically the most recent version. Testing these functions provided clues about each product's flexibility and speed, because finding older versions of files requires a more thorough search of a tape.

To test the robustness of our four backup products, we introduced real-world variables into our network. The running-application test, which consisted of backups performed while applications and a screen-saver module ran on each workstation, tested how well each product could do its job while "distractions" were present on the workstation.

We also performed a user-name test, in which we altered workstation user names and volume names before executing a backup script that was based on the original user and volume names. We wanted to see whether the products could back up the data on the changed Macs.

The missing-catalog test, designed for those products that use an on-disk catalog file, measured restore accuracy when the catalog file was damaged.

In addition to doing exhaustive speed tests, we evaluated each product's interface, ease of use, technical support, and documentation.

— Jeff Baher

DAT drive, and Memorybank Software comes with Memorybank's MT30 DAT drive. Both Tecmar and Memorybank also bundle their software with 8-millimeter tape drives. Neither company sells its software separately.

We tested Retrospect Remote and NetStream with an APS DAT drive containing an Archive mechanism, which is similar to that used in the

Memorybank MT30. The Tecmar DataVault 4000 DAT drive uses a WangDAT mechanism.

You can use an optical-disc drive for network backup, but you pay a price: An optical disc can store 128 megabytes to 1 gigabyte of data, whereas a DAT cartridge can hold as much as 5 gigabytes. DAT cartridges and DAT drives are usually cheaper, and DAT drives are always faster.

Alternative Routes

Picking a backup system should begin with an understanding of how much data you need to store. First, figure out how many users' Macs will need to be backed up. It's a good idea to keep backup sessions within a single network. If you have multiple networks separated by routers, set up distinct backup schedules or purchase a second tape drive and another copy of your backup software. Running backups across a *router* — a device designed specifically to direct and isolate network activity within a limited area — is slow.

You need to know the capacity of each user's hard disk(s) and whether it's important to back up removable cartridges and floppy disks. This information can help you pick backup hardware and media whose capacities are large enough to accommodate your data. Always leave room for growth.

You can buy tape drives that provide hardware compression and backup software that supports it. NetStream and Retrospect Remote each have their own compression system, which takes over if the tape drive you're using is not a compression drive. Hardware compression is preferable, because it's much faster. All the software products we tested support hardware compression.

Once you know the potential amount of data on your network, look at the way the data is generated in your organization to decide how often each user's disks should be backed up. For example, administrative assistants who each produce 50 letters a day can lose a substantial amount of work if a crash destroys their hard disks between weekly backups — it's better to back up their data every night. On the other hand, a sales team that spends a lot of time on the road is unlikely to generate a high volume of new data each day. You may choose to back up these people's data less frequently. If you choose a user-oriented product

such as Memorybank Software or NetStream, the users themselves can participate in this decision, requesting backups when they return from the road.

Next, you need to decide how much to back up. All the applications we tested let you specify that documents only are to be copied, because applications and system files are typically duplicated on floppy disks or on multiple machines on the network. Limiting backups saves time as well as considerable tape space. Retrospect Remote lets you back up the entire contents of networked machines but saves only one copy of duplicate files. The program's catalog file checks for files that have the same name, modification date, size, type, and creator, backing up only one copy. It keeps track of which files belong to which

users, in case there's a disk crash. Files with only a few attributes in common (for example, the same name and type but a different modification date) are backed up individually, preventing accidental erasure of similar documents. If you choose not to use this feature, you have to uncheck a box within the application, because the program defaults to this setting.

Once you've completed an initial backup of a network, you can save time and tape space by performing *incremental* backups — copying only the files that have been created or modified since the last backup was performed. The programs we tested use a *generational* approach, retaining all versions of the files that change rather than overwriting the earlier ones. This version history can be a lifesaver, letting you retrieve

You can buy tape drives that provide hardware compression and backup software that supports it.



MacUser LABS Figure 5: Racing for the Tape

Full Backup:

We backed up 16 workstations, an AppleShare 3.0 file server, and a QuickMail server. The 18 systems contained a total of 950 megabytes of data, of which approximately 650 megabytes were unique. The rest (applications and System files) were duplicated on multiple machines. The times reflected on the chart are averaged over three full backups. Retrospect Remote does not back up all the copies of duplicate files, giving it a tremendous speed advantage.

Incremental Backup:

After modifying several files on several workstations, we performed three incremental backups. Each backup copied to the tape only the files that had been changed. We added the times required for all three backups to produce a cumulative result. We noticed that the backup times reported by Memorybank Software while it ran differed substantially from those we calculated by subtracting the beginning time stamp in the log file from the ending time stamp. We used the calculated values for our results.

Full Restore:

Here's hoping you never have to do what we did. First, we erased the 80-megabyte hard disk on one of our graphics Macs (a Ilci). Then we used each backup product to perform three full restores, taking their average. Because NetStream does not restore data over a network, we connected the backup DAT drive to the AppleShare server and restored the data belonging to the Ilci's erased disk to a folder on the server. We then booted the Ilci with a floppy disk, mounted the AppleShare-server folder on the Ilci, and Finder-copied its contents to the graphics machine's hard disk.

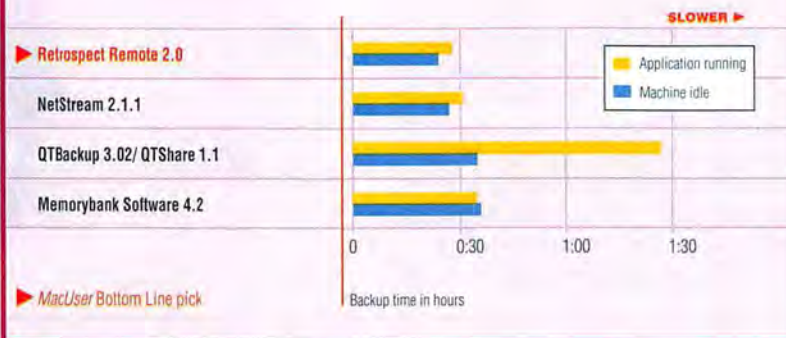


Network-Backup Software



Figure 6: Backup in the Background

Figure 6: We tested each backup package's robustness by performing full backups on three workstations while either Microsoft Word or QuarkXPress was open on each and while a Berkeley Systems After Dark screen-saver module was running. Memorybank Software lost no speed during this test because it takes the foreground, displaying a backup-status window during backup. Although the Mac is not inaccessible, its practical usefulness is severely limited. You can suspend a backup in progress if you want.



earlier iterations of files that may contain information you've inadvertently changed.

Marching Orders

The hallmark of good network-backup software is its ability to work behind the scenes. Most organizations perform backups at night, when employees are at home and the network is not in use. For this approach to work, your backup software must be highly automated and flexible. You must be able to provide the program with a set of instructions, a *script*, that it can follow in your absence.

Scripts can launch the backup software, look for Macs to be backed up, perform a backup according to certain specifications (an incremental backup of all the documents changed since yesterday on the Macs in the sales department, for example), log problems encountered, and shut down the backup machine. They can include some or all network nodes and can be set to exclude folders, applications, or system documents not in need of backup.

Each application we tested provides some scripting and scheduling functions. Memorybank Software and NetStream let users request a backup of their data, and the backup is then executed by an administrator who specifies the time. Retrospect Remote and QTBackup/QTShare leave the full backup process to the administrator, integrating the schedule with scripts that tell the software what is to be backed up and where it will reside. Retrospect Remote users can cancel backups of their machines that were previously scheduled by the administrator.

Although the products we tested each offered the basic set of scripting and scheduling features we were looking for, their user interfaces were varied. Retrospect Remote presents a clean, multilayered interface (see Figure 1), with plenty of guidance as you move throughout the scripting and scheduling process. QTBackup, too, possesses a well-organized interface (see Figure 2). NetStream's dialog boxes are chock-full of options (see Figure 3); unfortunately,

the program does a poor job of guiding users through the backup process. The weakest of the four interfaces is that of Memorybank Software, whose cluttered dialog box (see Figure 4) is made worse by the need for every user, not just the backup administrator, to work with it each time a backup is performed.

Setting Up Roadblocks

Backup time might seem a perfect opportunity for breaches in security. Data backed up over a network is vulnerable in two ways. It can be accessed directly on the tape through the use of the backup software's restore function. More-enterprising snoops can monitor data as it moves across the network, capturing and decoding the packets that comprise your backups.

Password protection is the first line of defense against unauthorized access to backed-up data. Retrospect Remote and the newest version of Memorybank Software let you password-protect the administration application. NetStream lets each user assign a password to requested backups; backup occurs on schedule without the password, but opening the backup file requires the use of the password. Retrospect Remote uses a similar scheme to protect its catalog files. Retrospect Remote's user passwords are assigned to the remote workstations, which are listed in the administrator application.

QTBackup/QTShare provides no password protection for users or for administrators, although users must activate a check box to allow a network restore of their disks. Memorybank Software lets users restrict backups to a particular master backup machine, so an unauthorized person who has a tape drive can't use the administrator application to perform backups over the network.

NetStream and Memorybank Software's user-oriented philosophy lets users choose what's backed up. Retrospect Remote allows users to exclude entire folders from being

backed up by placing a bullet character at the beginning or end of a folder's name.

Encryption — the scrambling of data before it travels across the network — is the best defense against network snoops. Encryption makes data unreadable by anyone with a network-packet analyzer, or *sniffer*. Sniffers intercept and decode information traveling across the network. NetStream and Retrospect Remote offer encryption; QTBackup and Memorybank Software don't. Encryption adds to backup time and may not be important to all users, but it does provide a valuable layer of protection in sensitive environments.

Yellow Light

Speed might seem to be a straightforward and objective measure of a network-backup product's performance. It is unlikely, however, to be as important a consideration as the combination of features and flexibility for which we tested. That's because these products are primarily designed for use when backup tasks have a network to themselves.

If you're worried about getting all of your data backed up overnight, look first to your network. If you're still using LocalTalk, run, don't walk, to the nearest purveyor of Ethernet paraphernalia. Upgrading to Ethernet speeds up all network-based activities, but backup functions show particular improvement. Next, examine the backup choices you've made. Try using a DAT drive that has hardware compression. You can also exclude applications and system files that are present on more than one user's hard disk from the backup sessions.

The Car-Pool Lane

ZD Labs performed nine tests of network-backup and -restore speed (see the "How We Tested Network-Backup Software" sidebar) and noted substantial differences among the four products tested (see Figure 5). In almost all cases, Retrospect Remote was significantly faster than

the others, partly because it backs up only one copy of duplicate files, which meant about one-third of the data on our network. NetStream was a consistent second, whereas QTBackup/QTShare and Memorybank Software had great difficulty keeping pace. As we went to press, Memorybank shipped upgraded software, which did show improved speed on some of our tests. On the full-backup test, Memorybank Software's time improved by approximately one-fourth, making its speed comparable with that of QTBackup/QTShare.

NetStream's performance on our network-restore tests is somewhat misleading, because the product does not restore data over the network. You must connect the backup tape

If you're still using LocalTalk, run, don't walk, to the nearest purveyor of Ethernet paraphernalia to speed up your backup.



MacUser LABS Rating Tech Support

Technical support is an important issue to consider with almost any large purchase, but it's especially important with network-backup software, because the applications tend to be complex and because variables such as hardware, backup media, and the network can all complicate backup and restore operations. We placed anonymous calls to each of the four vendors, asking for help with two typical problems. We noted how long it took to reach the company's tech-support staff; whether (and for how long) we were put on hold; and if we had to leave a message, how long it took a company representative to return our call. Once we'd connected with tech support, we evaluated each vendor's answers to the following questions:

Q. I recently completed a backup of all the Macs on my Ethernet network. In reviewing the backup contents, I noted that the backup had omitted one Mac on the network. What went wrong?

A. For the Mac that was omitted, Ethernet was not selected in the Network control panel.

Q. I recently executed a restore of one Mac over the network. In evaluating the success of the restore, I noticed that the software had failed to restore a particular file/folder. What went wrong?

A. The file you were trying to replace was locked or in use.

Dantz

Tech-support personnel were knowledgeable and friendly. They asked good questions about our problems and answered correctly.

Memorybank

Memorybank is well staffed with Mac specialists and provided help immediately. Unfortunately, they were unable to answer our second question to our satisfaction.

PCPC

From a knowledge standpoint, PCPC posts average marks, but accessibility is a problem. We left messages that were not returned, although we had better luck when we called again the next day.

Tecmar

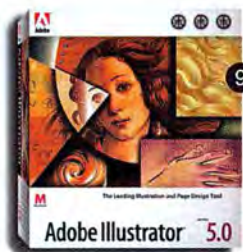
Tecmar has only one technician specializing in the Mac, which could be a problem if that person were unavailable. We received helpful responses, though, which should not be discounted.

Key	Excellent	Good	Fair	Poor



1 Sketch is now traced with Pen tool. 2 Two shapes that compose ear are constructed with Divide Fill tool. Mane is built with three tools: 3 Star filter creates a basic jagged shape; 4 Scribble filter randomizes star points; and 5 Twirl filter alters star point angles. 6 To create eyes, three colors are selected and placed in circular gradient. 7 Multicolor gradient generates this medley of tones with less banding. 8 Pathfinder tool is used in headline to isolate and create shapes occurring where areas intersect, permitting them to be colored separately. 9 Clicking on placed images can automatically launch Adobe Photoshop™ and its powerful tools. Paint Style Box (not shown) allows quick and easy selection of commonly used colors. This entire ad was created in Adobe Illustrator 5.0. Illustration by Ron Chan.

Forgive us if we howl a bit, but Adobe Illustrator™ 5.0 software has so much grace and power, it's hard to call it an upgrade. A new interface helps you manipulate tools with greater freedom, ease and precision. Adobe Illustrator 5.0 is the first drawing application that gives you Plug-in filters to expand your options. Powerful new Pathfinder technology provides precise control of intersecting areas or overlapping objects. Other surprises include Unlimited Layers, Edit in Preview, Multiple Undos, and a Pressure Sensitive Pen tool to create stylized paths and calligraphic effects. More discoveries await you in Adobe Illustrator 5.0. Remember, it's a jungle out there, and here's what you need to prevail. Call 1-800-833-6687, Dept. J, Ext. 1101 for information and your nearest Adobe™ Authorized Reseller.



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Network-Backup Software

► The Bottom Line

Our evaluation of network-backup software left us with one clear winner: Dantz Development's **Retrospect Remote 2.0**.

Retrospect Remote has long been the cream of the crop among backup products, for networks and for individuals, and many tape-drive vendors have bundled it with their products, for good reason. Retrospect Remote 2.0 combines speed with a complete set of features and options and an interface that is much improved over that of its previous versions.

Among the backup products we tested, Retrospect Remote won almost every performance test. Its speed is also much improved from previous versions. Retrospect Remote supports a wide array of backup devices, including those with hardware-compression capabilities. We were also pleased with the quality of Dantz Development's technical support.

Retrospect Remote comes with a license for 10 users, and 10- and 50-packs are available for adding more users. Street prices range from \$12 to \$27 per user, an excellent value.



Version 2.0 of Retrospect Remote makes a great network-backup product even better. It's slick, fast, and powerful.

drive directly to the Mac that has the crashed disk. Restores performed this way are not limited by the speed of the network. If you don't want to bring the tape drive to the problem machine, PCPC suggests that you connect the tape drive to a file server; restore data to the server; and Finder-copy files to the crashed disk, using file sharing. Some people may prefer these methods of data restoration to use of the network. Unlike backups, restores typically occur during the business day, when the network has other things to do.

We also simulated two common office situations that, if not anticipated by software developers, can trip up the backup process. First, because leaving applications running on users' Macs can slow down a backup, we tested each package's robustness by backing up three Macs that had a screen saver and an application running (see Figure 6).

Backup applications utilize a Mac's user name or the names of mounted volumes to identify nodes and hard disks for backup. For our second simulation, we changed user names and hard-disk names on two

of the Macs on our network and ran another backup with the names changed. Only Retrospect Remote handled the changes gracefully.

Do Your Homework

Network backup is truly a strategic exercise. It requires an understanding of the way data is created, modified, and stored on individual workstations and file servers. It also requires spending some time with the software you choose to learn what it can do and make those capabilities work for you. Our testing of this varied crop revealed a clear winner. You can find out which it was by reading the "Bottom Line."

Shelly Brisbin is a *MacUser* associate editor who backs up her hard disks every single night. Can you say the same? ZD Labs project leaders Jeff Baher and Jeff Davis managed the testing for this report.

Table 1 Criteria

Software list price — The vendor's suggested retail price for the software.

Software street price — The price of the software through mail order or at dealers surveyed across the U.S. in April 1993.

Bundle list/street price — The price charged for the package, when the backup software is included with the company's DAT drive.

Model — The tape drive sold with the software and that we used in our tests.

Media type — The tape format used by the drive.

Mechanism — The name of the mechanism inside the tape drive.

Media supported — The tape and disk formats to which the software can back up data.

Auto-loader support — Does the software support automatic tape-shuttling devices?

Archiving — Can the software back up data to tape and then delete it from the original medium?

Auto-launch — Can the software be scripted to start itself up, unattended?

Compression — Can the software compress backed-up data?

Session-log file — Does the software create a log of its activity during each backup session?

Cumulative-log file — Does the soft-

ware track and accumulate a log of backup activity over time?

Restore AppleShare volumes — Does the software re-create all AppleShare file and folder privileges when restoring servers?

Restore over network — Does the software allow restoration of data to remote Macintoshes over an AppleTalk network?

Scripting/scheduling — Does the software provide scripting and scheduling functions for unattended backups?

Server password — Does the software allow passwords to be set within the administrative application?

Encryption — Does the software support encryption of data as it is backed up over the network?

Client-controlled scheduling — Can users choose when data will be backed up to the tape drive?

Back up client floppies — Can the software copy the contents of floppy disks installed on client Macs at the time of backup?


Client-cancelable backup — Can users cancel previously scheduled backups of their machines?

Client-excludable files/folders — Can users exclude files or folders that are on a mounted volume from a network backup?

continues ►


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NAME Randy Hibbitts	
AGE 39	WEIGHT 2
HEIGHT 5'7"	HAIR Blk
EYES Hazel	SEX M

CASE NO: 63210



ARRESTING OFFICER Danny Kim	
PLACE OF ARREST Fairmont Drive	
CRIME Computer Tampering	
3 counts/started ZUC virus	

CASE NO: 38271



NAME Doug Nester	
AGE 32	WEIGHT 164
HEIGHT 5'3"	HAIR Blonde
EYES Brown	SEX M
ARRESTING OFFICER Sgt. Hans Logie	
PLACE OF ARREST Union Street	
CRIME Computer Tampering	
3 counts/started nVIR	

and various software programs, you need SAM 3.5 anti-virus software.

You see, SAM will constantly monitor for 14 suspicious viral activities. Which is more than any other anti-virus program on the market. And it's the only

program that will scan compressed files in System 6.0 and 7.0.

So basically, if your Mac has a virus, SAM will detect it, get rid of it and repair the file. And if your Mac is virus-free, SAM will help to make sure it stays that way. Because it monitors your

Mac transparently, working behind the scenes, and only interrupting when a virus is found.

What's more, SAM is simple to install on a Macintosh networking* system, as well as a single-user Mac.

All you need to do is load the program disk, double-click on the Installer Icon and let SAM handle the rest.

For the most anti-viral protection, pick up SAM 3.5 at your local retailer. It's the most popular anti-virus program in the world, and will keep you from ever having to deal with this ugly crime. Or these ugly criminals.

SAMTM
Symantec AntiVirus for Macintosh
SYMANTEC.



Junkbond dealers? Drug lords? Savings and Loan presidents?

Nope, they're computer hackers. And judging by their physical appearance, you wouldn't think you'd need any protection from them. But you do. Or should we say, your computer does.

And to keep these criminally minded people from infecting your files, floppies

Network-Backup Software

Table 1: Features of Network-Backup Software

	Memorybank Software 4.2 \$\$\$½	NetStream 2.1.1 \$\$\$	QTBBackup 3.02/QTShare 1.1 \$\$\$	▶ Retrospect Remote 2.0 \$\$\$½
● = yes ○ = no				
Software list price	NA	\$299 + \$49.95/user; 10-pack, \$199.95	10-pack, \$149	\$449 (10 users); 10-pack, \$249; 50-pack, \$1,095
Software street price	NA	\$170 + \$40/user; 10-pack, \$170	10-pack, \$125	\$275 (10 users); 10-pack, \$150; 50-pack, \$625
Bundle list price	\$2,680/unlimited users	NA	\$3,744	NA
Bundle street price	\$2,680/unlimited users (direct)	NA	\$1,255	NA
Pros		Good performance. Strong feature set.	Good interface and documentation. Easy to use.	Fast. Feature-rich. Excellent documentation.
Cons	Disappointing performance. Limited feature set.	Poor documentation. Tech support difficult to reach.	Uneven performance. Minimal feature set.	May be too complex for simple backup tasks.
Bundled hardware				
Model	MT30	NA	DataVault 4000	NA
Media type	DAT	NA	DAT	NA
Dimensions (L x W x H)	9.5 x 5.25 x 3.25 in.	NA	12 x 2.75 x 6 in.	NA
Weight	5 lb	NA	7.4 lb	NA
Mechanism	Archive	NA	WangDAT	NA
FCC certification	Class B	NA	Class B	NA
Software				
Media supported	DAT, 8-mm tape	DAT, 8-mm tape, all mountable media	DAT, 8-mm tape, DC 6000	DAT, 8-mm tape, QIC tape, all mountable media
Auto-loader support	●	○	○	●
Minimum Mac configuration	Plus	512Ke	Plus	Plus with hard disk
Minimum System version	6.0.3	6.0.4	6.0	6.0.5
Software features				
Archiving	○	○	○	●
Auto-launch	●	●	●	●
Compression	●*	●	●*	●
Session-log file	●	●	●	●
Cumulative-log file	●	●†	●	●
Restore AppleShare volumes	●	●	●	●
Restore over network	●	○	●	●
Scripting/scheduling	●	●	●	●
Server password	○§	●	○	●
Encryption	○	●	○	●
Client-controlled scheduling	●	●	○	○
Back up client floppies	●	●	●	●
Client-cancelable backup	●	●	○	●
Client-excludable files/folders	●	●	○	●
Warranty	1 year	none	2 years	90 days (money back)
Company	Memorybank, Inc. 2223 Packard Rd., Ste. 12 Ann Arbor, MI 48104 800-562-7593 313-761-2782 313-761-3263 (fax)	PCPC 4 Daniels Farm Rd., Ste. 326 Trumbull, CT 06611 800-622-2888 813-530-0123 203-243-5329 (fax)	Tecmar 6225 Cochran Rd. Solon, OH 44139 800-624-8560 216-349-0600 216-349-0851 (fax)	Dantz Development Corp. 1400 Shattuck Ave., Ste. 1 Berkeley, CA 94709 510-849-0293 510-849-1708 (fax)

* Software supports hardware compression.

† Log files track all backups on a given day and are then reset.

§ Server password feature added in version 4.3.

▶ **MacUser Bottom Line pick**

Disk Array Power!

Upgrade Existing Apple 500 or 1000 MB Drives
to a Fast Raven-800 Disk Array. Ask About Our
16 GB DDS-2, DAT and 1.3 GB Optical Systems.

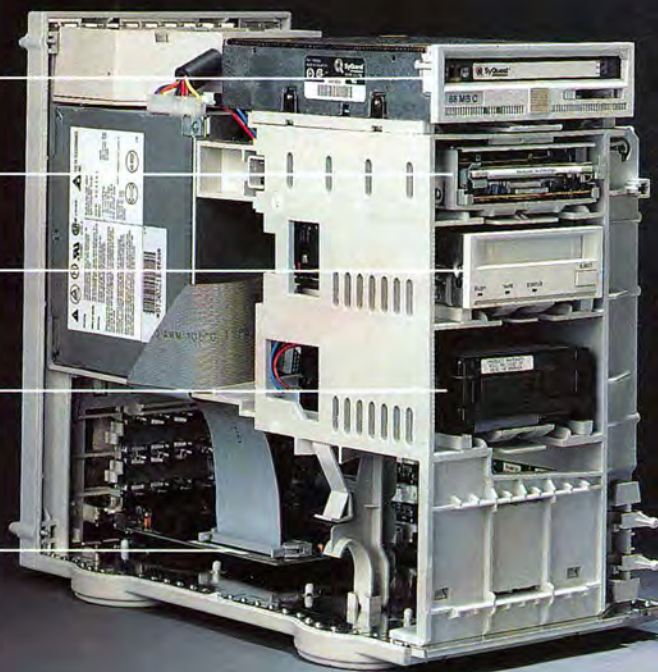
5.25" - Top Bay
Removable Media

Floppy Drive Bay

3.5" - 3rd Bay
Removable or Fixed

3.5" - 4th Bay
Fixed Disk Drives

MicroNet NuPORT-III
Second SCSI Port
Used With Raven-800



Raven-800
Two Drive Disk Array



MicroNet's Raven-800. Disk Array Power For The Quadra 800.

MicroNet is the first to bring disk array power to the Quadra 800. With a matched pair of fast spindle drives, the Raven-800 delivers up to 9.2 MB/second sustained transfers with access time as fast as 4 ms.

Disk arrays can improve performance up to 400 percent over standard drives. Combine MicroNet's Raven-800 disk array with the speed of the Quadra 800 and you have an unbeatable system for applications such as PhotoShop, file servers, and full rate digital video and audio recording.

Cost effective two drive disk arrays are available in capacities of 1030 to 5560 MBytes and are expandable to more than 38 GBytes. MicroNet also offers single disk drive systems that can be upgraded to a Raven-800 disk array at a later date.

Built on award winning technology, the Raven-800 takes full advantage of Apple's existing hardware. One drive connects to the native SCSI port of the Quadra, and one connects to a MicroNet NuPORT-III, SCSI-2 host adapter. Together, these two drives create a fast, parallel, 16-bit data path.

MicroNet has designed a complete family of internal storage systems for the Quadra 800. Included are SyQuest removable systems, rewritable optical drives, and DAT backup systems. All are shipped complete with custom designed bezels.

To put high performance disk array power in your Quadra 800, call MicroNet's Sales Department for configuration assistance or the name of your nearest Reseller. 1-714-581-1540.



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AppleLink: MICRONET.SLS • Compuserve: 76004,1611



Raven-800 is a trademark of MicroNet Technology, Inc. All other trademarks are the property of their respective owners.

CIRCLE 114 ON READER SERVICE CARD.

Avant Garde
Bob's Font
Bodoni
Chicago
Futura Fling
Optima
Terry's Times

Name your fonts and select them from any font menu.

3/16

A technical document might need a range of fractions or special symbols; create them quickly and easily in a custom font. Time taken to create: 1 minute. Keystrokes required: 6.

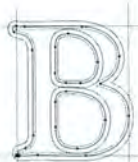
W. J. Shultz

Autotrace your signature or any other scanned image—place it in a font and assign it to a keystroke.

Use the calligraphic or pressure-sensitive tool—as well as a full range of drawing tools to design your font from scratch.



Design and create a logo; then assign it to a keystroke.



Blend two fonts to create a third. Time taken to create: 2 minutes. Keystrokes required: 5.

abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
LMNOPQRSTUVWXYZ
Z1234567890!@#\$%^&
*() + ?

This font "TFHabitat" was created in Fontographer by Joe Treacy of Treacyfaces, Inc.



Fontographer always opens a copy of your existing font, keeping your original intact.

Now shipping, with over one billion fonts.*

Fonts are like money; the more you have, the more you're able to do. Just think what you could accomplish if you had access to an infinite number of fonts.

Fontographer® 4.0, the type manipulation and design program from Altsys, gives you that.


And more.

Fontographer actually lets you open copies of your fonts and—without drawing a thing—automatically modify characters and add new ones, turning your existing typefaces into entirely new personalized PostScript® language and TrueType® fonts.

Logical one-step commands make font customization quick and easy. With our new version of Fontographer, anyone can blend two fonts to make a brand

new one. Vary italic angles. Automatically space and kern any font. Autotrace scanned images to create new characters. Or instantly increase and decrease type weight.

Fontographer also lets you incorporate graphics into your fonts. Imagine a company logo or your signature as a keystroke.

Here's one we recently added to this font: our  review rating from MacUser. According to MacUser's Bruce Fraser, Fontographer is the "tool of choice for creating fonts on the Macintosh."

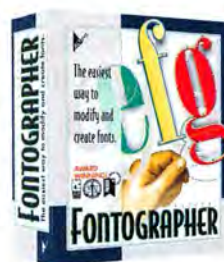
Fontographer's straightforward interface means you can be creative without being confused.

In fact, the hardest part about using Fontographer may be dreaming up names

for all your new creations. But just in case you do need some help, we offer free, unlimited, technical support.

To purchase, contact your local dealer or call us at 1-800-477-2131.

Ask us about our Windows version.



1992 Winner MacUser

Fontographer
The easiest way to modify and create fonts

**1-800-477-2131
Ext. 1023**

Version 4.0 now shipping



From Altsys, the people who write Aldus FreeHand®

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All product names are the property of their respective owners.

*How can you get over one billion fonts? It's easy—multiply your current font collection by your imagination.

CIRCLE 20 ON READER SERVICE CARD.



DESKTOP PUBLISHING

Back to school: After patiently explaining **ppi versus dpi versus lpi** to a confused reader, I wished I had a copy of Pixel Ink's interactive tutorial on resolution to send him. Among other things, this two-disk set deciphers the differences between pixels per inch, dots per inch, and lines per inch and spells out the relationship of scanned-image, monitor, and output resolutions. 415-564-0962. \$32. ♦ If you're ready for **headier stuff**, graduate to Electronic Halftone Principles, Segment Two, an animated, interactive CD-ROM, from Vision Publications. This tutorial describes the conventional printing process, including dot



generation and dot gain, and then explains how digital techniques simulate the process with rational and irrational screen angles. The graphics and narration are clear and informative, but watch out if hearing phrases such as "electronic matrix perturbations" makes you queasy. 215-255-0798. \$99.50.

Font fables: Most font vendors hawk their wares in pretty catalogs. But if you'd like to learn about type and the people who design it, consider subscribing to these two quarterly magazines-cum-font-catalogs (**marketzines?**): *U&lc*, published by International Typeface, and *x-height*, published by the folks behind FontHaus. *U&lc*, now in its 20th year, features articles about top designers working in all fields and provides a historical perspective on type-related issues. With each issue designed by a different person, *U&lc*'s look is often uneven, but it's still a showcase for display typography. 212-371-0699. \$30 for a three-year subscription. ♦ *x-height* has undergone several

incarnations since it began, in 1991. It's now an elegant magazine featuring interviews with type designers, samples of new type, pages of Font-



Haus type samples, and other tidbits. A recent interview with type designers Matthew Carter and Cherie Cone made **fascinating reading**. 203-367-1993. \$18 for a one-year or \$29 for a

two-year subscription. Adobe's much admired *Font & Function*, by the way, is on a hiatus, perhaps permanently.

Type drawer: If you're more interested in seeing the fonts you already have, you'll need a type-cataloging program such as theTypeBook 3.0, by Jim Lewis. This software lets you automatically generate hard-copy **specimen sheets** of your fonts. You just select the layout style and pick the fonts, and the application does the rest. theTypeBook's customizable layouts contain such useful information as font ID number and format, and its six-up layout is great for comparing the attributes of extended families. It's yours if you send a disk and an SASE with 52 cents of domestic postage to Golden State Graphics, 2137 Candis Avenue, Santa Ana, CA 92706; 714-542-5518. ♦ And remember that **fonts are fun** too — take Letraset's way-happening Fontek DesignFonts. This collection of dingbats comes in both Type 1 and TrueType formats and can be used as typographic elements or full-blown illustrations. Buy each set (Attitudes, Organics, Naturals, Radicals, Primitives, and Incidentals) for \$89.95 each or all six for \$349. 800-343-8973 or 201-845-6100. Ⓜ



By Pamela Pfiffner

Family Pictures

Use Adobe Photoshop and Fractal Design's Painter to add color and painterly detail to scans of family photos.

By Janet Ashford

Faded photos from the back of a drawer become beautiful digital color paintings in the hands of New York illustrator Ellie Dickson. Using Adobe Photoshop, Fractal Design's Painter, and a Wacom graphics tablet, Dickson adds color and texture to old family photos. Although most of Dickson's work is commercial art, she's especially fond of working on commissioned paintings.

Dickson begins by scanning a photo at 300 dpi and lightens the scan in Photoshop. "It's a little like working with ghosts of the image," says Dickson. "I try to lose literal details so that I can reapply them in a more painterly style." Still using Photoshop, she adds a layer of color tint to areas of the scan and then opens the image in Painter, employing that program's

natural-media tools and the Wacom tablet to add bold brush strokes and fine lines.

For a 1935 picture of three children, Dickson used Painter to exaggerate the light and dark areas, add rich colors, and apply a paper texture. She made customized tools for adding strokes of color, used the water-drop tool to blend color areas, and finished by using a customized eraser tool to emphasize the highlights.

The artist printed the final image with an Iris SmartJet printer on 11-x-17-inch, 90-pound cold-press Arches watercolor paper.

Janet Ashford is coauthor of *Aldus PageMaker* and *QuarkXPress: A Visual Guide for the Mac*.

A small family photo, treasured since 1935, becomes an 11-x-17-inch art print when artist Ellie Dickson scans and then retouches it, using Adobe Photoshop and Fractal Design's Painter. The portrait, commissioned by the now-adult little boy on the right, is output as an Iris print on archival-quality watercolor paper.



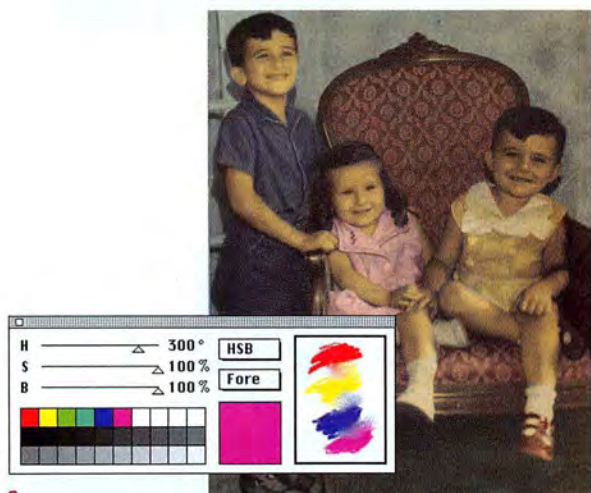


a

b

1 Lightening the Photo

Dickson scans the original photo as a 300-dpi gray-scale TIFF image, using a Microtek 300Z scanner (a). She opens the scan in Photoshop, calls up the Brightness/Contrast controls (under Adjust, on the Image menu), and lightens the photo by moving the Brightness slider to the right to a value of +85 (b). Dickson's goal is to remove some of the fine detail so that as she reworks the image, the final result looks more like a painting than like a tinted photo.

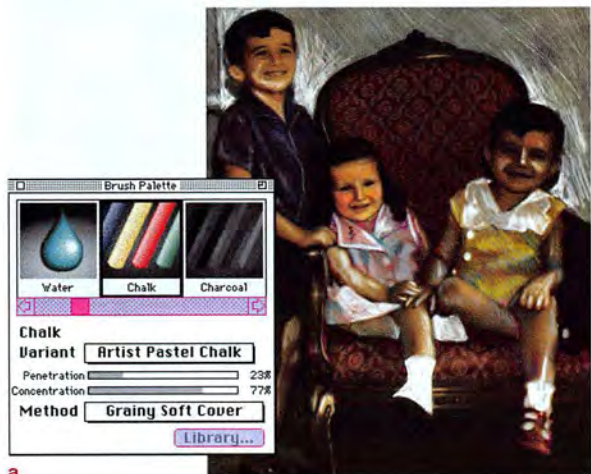


a

b

2 Adding Color Tints

When painting photographs, Dickson builds up layers of color. She starts the process in Photoshop by using the lasso tool to select areas of the scan and apply color tints. (She softens the edges of the selection areas with a 1-to-2-pixel feather). To create custom colors, Dickson calls up the floating color palette (the command is Show Palette in Photoshop 2.0, Show Colors in 2.5; both are on the Window menu) and changes it to HSB (hue, saturation, brightness) mode. She blends colors in the palette's mixing area (a) and then uses the eyedropper tool to choose the colors she wants. Working in Color Only mode, she uses the Fill command to apply colors at 15-percent opacity, which lets the underlying gray-scale values show through (b).

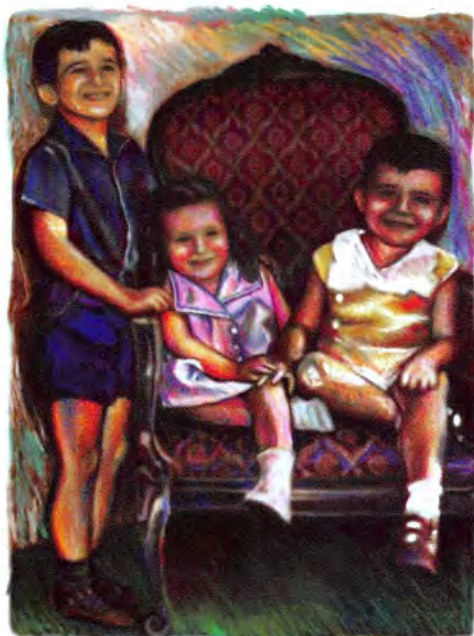


a

b

3 Exaggerating Lights and Darks

After bringing the image into Painter, Dickson applies a fine-grain paper texture. She then creates a custom version of the chalk tool (a), specifying a penetration of 23 percent (this determines how the electronic "paper" absorbs the color) and a concentration, or opacity, of 77 percent. With her Wacom stylus in hand, she uses her custom Artist Pastel Chalk tool to emphasize the lightest areas of the image with white and to exaggerate the darkest areas of the portrait with deep colors (b).



4 Softening the Image

Dickson continues to layer colors with her custom chalk tool and to draw small details with the colored-pencil tool. After applying bold brush strokes to the background, she uses Painter's water-drop tool to blend between color areas and to soften edges.



5 Refining the Palette

To tone down the image's color palette, Dickson paints over and softens the chalk strokes, using Painter's watercolor tool — now with fewer colors. She continues to use the water-drop tool to soften the edges between color areas.



6 Highlighting with the Eraser Tool

Finally, Dickson uses a customized eraser tool (with penetration set to 80 percent and concentration set to 75 percent) to highlight the children's faces and clothes by removing some of the color value. Using the chalk tool, she adds emphasis to the darker edges and then darkens the background to make the figures stand out.



a



b

7 Creating More Electronic Paintings

Using similar techniques, Dickson transforms this snapshot (a) into a painting (b). In this case, she crops the original photo and uses Photoshop's rubber-stamp tool to sample the background and paint out the extraneous figures that appear behind the mother and two girls.

Imagine upgrading
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with just one of these.



QMS is leading the way to a new era in seamless network printing with its Crown™ print system family. Now, your QMS® print system can keep pace with the technologies of the future with simple, cost-effective updates. The QMS 2025, QMS 3225, QMS 4525 and the QMS ColorScript® Laser 1000 already use software loadable system technology, so it's easy to enhance and upgrade them via diskettes. And all QMS print systems utilize Crown multitasking technology, which allows them to receive, interpret, compile and process multiple documents simultaneously while yet another document prints. QMS print systems work with a broad range of system platforms and connect directly to all major network environments. So choose the QMS print system that's right for your needs today with adaptability that defies obsolescence.

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CIRCLE 81 ON READER SERVICE CARD.

The Simple Choice in Ethernet Adapters:



The Haves.

The Have Nots.

Dayna Has More New Features Than Any Other Cards On The Market

The company that set the standard in Ethernet connectivity with our award winning EtherPrint™ has set a new world class standard for Ethernet adapters. Check the comparison chart on our competition. Then look at the latest improvements we've made to our DaynaPORT™ line, including our new lower prices. We think you'll agree that our Ethernet cards are in a class of their own.

FEATURES	Dayna	Asanté
Card for every desktop Macintosh	✓	✓
Ethernet for PowerBook Duos	✓	
Apple Ethernet driver compatible	✓	✓
Lifetime warranty	✓	
3-in-1 Ethernet connectors	✓	✓
Media compatibility guarantee	✓	
SCSI Ethernet adapter	✓	✓
100% Apple SCSI manager compatible	✓	
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Apple SNMP support	✓	
Network distribution software	✓	
24-hour repair or replacement	✓	

1. Network Distribution Software

Managers of large networks will buy Dayna for this hot new feature alone. Every DaynaPORT adapter now supports NetInstaller™, our unique distribution software. Save time and effort by distributing drivers to users across the network from one central location.

2. Apple Ethernet Driver Compatibility

Our NuBus and LC cards are fully compatible with Apple's Ethernet driver. And as an added bonus, our LC cards come with the Apple driver already in ROM, making them truly "plug-and-go."

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For network managers with SNMP (Simple Network Management Protocol) management software, our cards now support AppleTalk Connection for Macintosh, Apple's new SNMP agent. All important statistics can now be reported to an SNMP console from our cards.

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Dayna

Macintosh Networking Specialists

CIRCLE 133 ON READER SERVICE CARD.



Bulletin-board bulletin: SoftArc (416-299-4723) now has a Windows client for FirstClass, its popular Mac bulletin-board system. The client view of a FirstClass BBS is highly graphical, so it's easier to navigate than character-based systems are. With the new Windows-client support (starting at \$395), users of both platforms can **BBS the day away** in

their native environments. ★ PacerForum 2.0, the new version of Pacer's groupware/network BBS package, is stepping up its pace, with improvements for users and administrators. Users get more-flexible notification plus easier navigation and topic organization; administrators get easier ways to monitor server load and maintain users and groups. 619-454-0565. \$549 for 5 users; \$1,995 for 25 users (upgrades from previous versions are \$109.95 for 5 users and \$399.95 for 25 users).

Local boosterism: People love to hate LocalTalk, but it's still popular. P-Con (408-270-3200) may add to this popularity with its new, nonintelligent LocalTalk hubs: the 12-port P-Shooter (we kid you not), for \$695, and the 24-port PS-2400, for \$895. These hubs **regenerate packets** rather than



simply retransmitting them, a strategy that P-Con claims significantly improves LocalTalk performance and reliability.

Remote-access revelations: For an easy way to set up ARA connections, check out Trilobyte Software's \$19.95 ARACommander. It lets you create double-clickable *connectors* that contain all

the configuration information needed to set up a link. Connectors are also able to automatically mount volumes and open files or folders once the ARA connection is established. 513-777-6641. 10-pack, \$149.95; 20-pack, \$239.95; 50-pack, \$459.95; 100-pack, \$799.95. ★ APT now has a three-port Ethernet ARA server that **surpasses all others**

in security features. The \$1,695 APT Dial Server lets you limit individual dial-in users' access to specific networks, zones, and even devices; you can also apply limits to groups of users. Each server has many monitoring mechanisms for easy troubleshooting, and you can configure multiple servers in one fell swoop. 800-842-0626 or 301-831-1182.

Software surveyors: Yes, you *can* ease the thankless chore of policing software-license compliance — with the latest version of Sassafras Software's KeyServer. As well as keeping track of the number of simultaneous users for each application, KeyServer 3.1 supports server fault tolerance and lets individuals use licensed software away from the network by “checking out” a key. 603-643-3351. \$35 to \$70 per client, depending on the size of your setup. ★ Teknosys (813-620-3494) now has a network version of its Help! diagnostic and support tool. Help! Network contains a database of known software conflicts and other problems; after collecting profiles from Macs on the network, Help! Network compiles a list of potential problems and **gives you advice** about solving them. \$520 for 25 users; \$989 for 50 users; \$1,656 for 100 users; quarterly database upgrades, \$149 per year. ☞



By Stephan Somogyi



Score Ethernet savings.

Farallon introduces new products—and new prices—for the savvy Ethernet shopper.

Ethernet Cards for the Mac

	SRP*
EtherMac II (Nubus) family—10BASE-T	\$189
EtherMac II (Nubus) family—Thinnet	\$189
EtherMac II (Nubus) family—Combo	\$249
EtherMac LC—10BASE-T	\$189
EtherMac LC family—Thinnet	\$189
EtherMac LC family—Combo	\$249
EtherMac LC family—10BASE-T w/FPU	\$305
EtherMac LC family—Thinnet w/FPU	\$305
EtherMac LC family—Combo w/FPU	\$359
EtherMac IIsi & SE/30—10BASE-T	\$229
EtherMac IIsi & SE/30—Thinnet	\$229
EtherMac IIsi & SE/30—Combo	\$289
EtherMac IIsi—10BASE-T w/FPU	\$345
EtherMac IIsi—Thinnet w/FPU	\$345
EtherMac IIsi—Combo w/FPU	\$399
EtherMac SE—Combo	\$249

Ethernet SCSI Adapters for Macs & PowerBooks

	SRP*
EtherMac SCSI/Mac—10BASE-T	\$ 339
EtherMac SCSI/Mac—Thinnet	\$ 339
EtherMac SCSI/PowerBook—10BASE-T	\$ 359
EtherMac SCSI/PowerBook—Thinnet	\$ 359

Ethernet Transceivers

Ether10-T Transceiver—AUI	\$ 85
Ether10-T Transceiver—AAUI	\$ 85
EtherThin Transceiver—AUI	\$ 85
EtherThin Transceiver—AAUI	\$ 85

Ethernet Hubs

Ether10-T Starlet, 9-port 10BASE-T hub	\$ 339
Ether10-T StarController, 12-port, 10BASE-T, 110V, managed hub	\$1399†
Ether10-T StarController/557, 12-port, 10BASE-T, w/SNMP, 110V, managed hub	\$1599†

When you're shopping for Ethernet, it's always great to find what you need. It's even better to find great prices.

With Farallon, you not only get both, you also get compatibility with Apple EtherTalk Drivers, SNMP support, special education pricing and a lifetime warranty. All from the company that's connected more Macs than anyone.

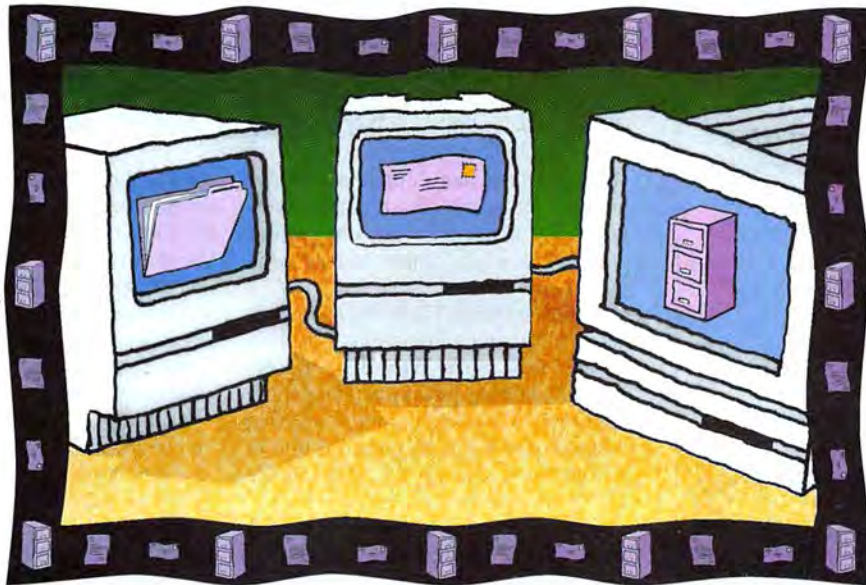
We make it easy to get more information, too. Just call **1-800-998-7760 extension 0**. What a bargain.



*Prices are suggested retail and subject to change. †For Concentrator version. Stand alone add \$200. ©1993 Farallon Computing, Inc. All rights reserved. StarController and the Farallon logo design are registered trademarks, and EtherMac, Starlet, and Ether10-T are trademarks of Farallon Computing, Inc. For customer service, call (510) 814-5000. Or contact us on America Online® or AppleLink® ID: Farallon. CompuServe® ID: 75410, 2702. Internet ID: farallon@farallon.com.

CIRCLE 92 ON READER SERVICE CARD.

Simple Network Secrets



Three simple, low-cost ways to get more out of your small-business network — and some tips for getting more ambitious.

By Shelly Brisbin

Starting a small network of Macs can be so easy that you may want to go little further than the initial plug 'n' play. Once you have everyone in the office printing to the LaserWriter, what more do you need? After all, your small department or business can't afford fancy network capabilities that cost a lot of money or a lot of someone's time to maintain.

Ah, but your simple network can do more for you than you think. With a lot less work and expense than you might expect, you can implement three basic capabilities — file sharing, messaging, and database sharing — that let you make much more productive use of those modest gray LocalTalk cables that connect the Macs in your office.

Sharing Some Files

Besides printing, sharing information with other Mac users in the office is the best use you can make of your network. Replacing *sneakernet* (copying a file to a floppy disk and handing it to your colleagues, who copy it onto their hard disks) with an electronic means of file transfer makes sense. And if you have System 7, you have the capacity for electronic file transfer built right in to your system software: It's called file sharing, and it lets everyone in your office exchange files as easily as copying them to a floppy disk.

With System 7, you can become a file-sharing *host* — that is, share the contents of your hard disk, or even of single file

folders, with other users on the network — quite easily: Use the Users & Groups control panel to specify who can access your disk, use the Sharing Setup control panel to turn file sharing on and off, and use the Sharing option on the File menu to set the *access privileges* that regulate others' use of a selected folder or disk. To see and use the contents of another user's shared folder or disk (assuming you have the appropriate access privileges), just open the Chooser, select a shared Mac, and mount the folder or disk from the shared Mac on your own Mac's desktop. You can then copy files to and from the shared *volume* or open documents stored there.

Here are some tips for using file sharing:

- **Create an electronic in box.** Create a folder on your hard disk. Call it Mary's In Box or something similar. Set access privileges to allow people in your office to drop files into the folder. You may want to set privileges so that coworkers are prevented from seeing or removing what's already in the folder.

- **Share project files.** If several people are working on a project, create a shared folder on one hard disk and store all the project's files there. Each user can copy or open the file from the shared volume. Everyone sees the same, current version of project files, and changes become instantly available to the entire group. Again, you can use access privileges to restrict access to those people who are working on the project.

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• **Be realistic.** Don't think of file sharing as a replacement for using a file server (see the "Becoming Server-Savvy" sidebar). Although you can share one folder or an entire hard disk this way, file sharing has its limitations. Each host can share only ten items (files, folders, or volumes) at a time. Sharing items costs you a bit of memory and slows down your CPU when others access what you've shared.

• **Plan to share.** The best way to mitigate file sharing's limitations is to plan its use. First, share only those folders needed by others rather than your entire hard disk. Ask users to mount a shared volume only when they need it and to release the volume (by dragging it to the Trash) when their work is done.

• **Bring System 6 users on board.** Users of System 6.04 and later can access shared files by installing AppleShare workstation software, which is included on System 6 installation disks. System 6 doesn't allow you to initiate file sharing, however. For that, get Public Folder, available on ZiffNet/Mac (PUBFOL.SIT, in Library 3 of the Download & Support Forum) and other on-line services. Once Public Folder is installed, you can create one public folder on each System 6 machine. File-sharing users and other System 6 users can then copy files from those public folders, but they can't put files into others' public folders.

Chat and E-Mail Software

You need to tell the shipping manager, the bookkeeper, and other folks that you've just closed a big sale. You could call a meeting or shout the news over the intercom, but what you really need is a way to put information onto the desktops of those folks: a chat or electronic mail (e-mail) system.

The full-scale e-mail applications used in large companies are sometimes beyond the budgets of smaller businesses. In addition to costing some money, these packages often require that you set aside a Mac as your e-mail server. However, you can find smaller-scale applications that offer basic messaging capabilities without making much of a dent in your budget or requiring a dedicated server. Chat software lets one networked user



File sharing lets everyone in your office exchange files as easily as copying them to a floppy disk.

send a short message (in real time) to another person on the network. More-traditional small-scale e-mail packages let you write, address, and send a note to one or more users, which they can save as text, paste into a report, or keep as a reminder of ongoing projects. In some cases, you can even attach Mac files to your mail messages.

• **Chatting It Up.** Most chat software comes from shareware or freeware developers. You can find several such programs on ZiffNet/Mac.

Broadcast 2.0 (BCAST.SIT, in Library 3 of ZiffNet/Mac's Download & Support Forum) is about as basic a chat

Becoming Server-Savvy

Sharing information over a network is a great way to make your small business more productive, but make sure you don't become a victim of your own success. Sharing lots of databases and other files slows down the Mac on which the information is stored — a real drag if it's the Mac on your desk. As you generate more data, you may also find that disk space is harder to come by. When these annoyances turn into noticeable hassles, it's time to consider adding a file server to your office.

A file server is a Mac (preferably a 68030- or 68040-based model with at least 8 megabytes of RAM and the highest-capacity hard drive you can afford) or PC whose only job is to store and share information or applications with everyone on the office network. It must be equipped with server software in order to perform these tasks. Because it isn't used by an individual for daily tasks, a server can devote all of its processing power and disk space to shared tasks. You can take advantage of its power to gain capabilities such as the following:

• **Faster, centralized file storage.** Putting all of your shared files onto a dedicated Mac with no user overhead is a logical way to share files more efficiently as well as to make them easier to find

program as you can get. Once you've installed Broadcast around the office, just open the Chooser, click on the Broadcast icon, and pick the person to whom you want to send a note. Type a three-line message into the dialog box, and click on the Send button. A window displaying your message then appears on the recipient's screen. The recipient can respond to your message, and voilà — you're having a two-way network chat.

NetChat (NETCHA.SIT, in the DAs/Fkeys section of CompuServe's Mac Systems Forum) and other products take the process one step further, allowing several people to have a "live" conference, sending and reading each others' messages. You can even save the entire conference as a text file. This way, you can hold a meeting on your Mac and have an instant (and accurate) record of everything that's said.

Chat software offers



many possibilities for enhancing small-office communication:

- **Send an all-points bulletin.** If your office doesn't have an intercom system, use a chat program to locate the only person in the building with the key to the storeroom.

- **See into your waiting room.** A receptionist can send a message (while you're on the phone, no less) that your most important client is waiting to see you.

- **Have a short meeting.** Get a few people together electronically to brainstorm new marketing ideas. You'll find that people aren't quite as long-winded

You can find e-mail applications that offer messaging capabilities without making much of a dent in your budget.

and back up. You'll want to use Apple's AppleShare (version 3.0, for small networks, costs \$1,100) or other file-server software on the server Mac rather than System 7's file sharing, which is slower and less capable. AppleShare lets you divide the server's hard disk into volumes and set access privileges for those volumes. In addition to security features, AppleShare provides some print-spooling features (you can view information about documents waiting to print at a particular printer, for example, and cancel jobs as needed) and it can easily handle many simultaneous users. One caveat: Although AppleShare runs in the background, permitting you to run other applications as well, we don't recommend that you use an AppleShare server for any other purpose.

- **Efficient database sharing.** Putting a multiuser database onto a server frees networked Macs from the strain of running the database program and users' applications. As your database grows, you'll definitely want to have a high-capacity hard drive for your server Mac.

- **Group scheduling.** Group scheduling software lets you arrange meetings and share calendars with everyone in the office. Although schedulers such as Now Software's Now Up-To-Date 2.0 (\$99

for one user, \$399 for five users, \$599 for ten users) or ON Technology's Meeting Maker 1.5 (\$495 for five users, \$895 for ten users) aren't meant to reside on a user's Mac, these programs can run comfortably on a server with some other multiuser applications.

- **Full-service e-mail.** As more people join your company, or as you find yourselves communicating more and more via e-mail, simple e-mail or chat software may no longer fit the bill. If you decide to move up to a mainstream mail package such as Microsoft Mail, CE Software's QuickMail, or Lotus' cc:Mail, you will need to invest in a server. These *store-and-forward* mail packages use the server to create and maintain mailboxes that store the mail for each person on your network.

- **Most of the above?** Provided that no conflicts exist among the packages you want to use, you can employ a single server to give users access to multiple server-based applications. You might well want to use the same server for a shared database program and a group scheduling application, or for implementing both a scheduling system and a full-fledged e-mail system. To keep things efficient, however, you probably won't want to put more than two applications on one server — or more than one, in the case of AppleShare.

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within the constraints of chat software as they are in person.

• **Don't get carried away.** Using chat software to get your coworkers' attention can be fun, but be considerate of others whose work might be interrupted by lots of messages popping up on-screen without warning. If you don't want to be interrupted yourself, temporarily turn the software off from the control panel.

• **E-Mail Options.** Using an e-mail application such as SpeedMessage (shareware — \$10 per user — filename SMESSA.SEA, in Library 1 of the ZiffNet/Mac Download & Support Forum) is another way to get your message across in a small-business environment. E-mail recipients get an alert or a flashing icon, depending on the program, when new mail arrives and can read and respond to the message at their convenience. If you have SpeedMessage and your Mac is equipped with a microphone, you can send voice messages as well.

The commercial products IsisNotes, from Isis (\$100 for five users, \$160 for ten), and SnapMail, from Cassidy & Greene (\$125 for five users, \$200 for ten), are a bit more sophisticated. Each adds file transfer to basic e-mail. In SnapMail, you just attach a Mac file or the contents of your Clipboard to messages you send. In IsisNotes, you need to send the file separately. You can also use SnapMail for live conferencing. These products aren't as snazzy as the e-mail packages favored by big-budget corporations, but they don't require a dedicated Mac and are a lot less expensive.

Shared Databases

Every organization has some sort of database, whether it's a list of customers and invoices or a newsletter mailing list. Unless you have an efficient way to share such information, however, it's unlikely that your business is making the best use of its data.

By sharing databases, everyone can use the same information, with instant access to changes. Each user can look up addresses, part numbers, and other valuable business data without riffling through stacks of paper or bothering an overworked database administrator. With careful planning, you can accomplish this at a reasonable cost.

There are two ways to share databases without setting aside a Mac (or PC) as a server: file sharing and using multiuser software.

The File-Sharing Approach. As we've discussed, file sharing lets you make information stored on one Mac available to some of or all the people in your office. This approach works best with databases that are managed by one person, with others needing access only occasionally. Put the database software and files on the Mac of the main database user, and grant file-sharing access to others. The catch is that only one person can use the file at a time. Ask all users to close the database immediately every time they finish using it.

If you use a file-shared database, be sure to check the box (in the Sharing dialog box, on the File menu) that prevents users who share the database from moving, renaming, or deleting it. You'll want to take this precaution with any file shared by lots of people regularly, but it's particularly important with databases. If the file-shared database isn't where it belongs or if several versions are floating around, the resulting confusion can cost you lots of time and money. Protecting databases is also a good way to keep novices from inflicting accidental damage on your files.

The Multiuser Method. Multiuser database programs such as Claris' FileMaker Pro (\$399) let several people work with information at once. The database to be shared resides on one user's Mac,

What Cost, Ethernet?

Networks are like computers: The more things you find to do with them, the slower they get. When a LocalTalk network's speed becomes insufficient, it's time to make the move to Ethernet.

Need some numbers? Ethernet gives you four to ten times the real speed of your LocalTalk network. The dollar-amount numbers are more complicated, however, because you need three types of special hardware for Ethernet: wiring, adapters, and hubs.

Getting Wired

Unlike LocalTalk networks, which snap together effortlessly, Ethernet requires more and sturdier wiring. If you're wiring for a small business, chances are that 10BASE-T, the cheapest and most popular type of Ethernet wiring, is for you. A 10BASE-T network requires two pairs (four wires) of twisted-pair wiring, similar to that used for telephone wiring. If your LocalTalk network uses regular phone

and the program's multilayer password system lets the host give some people access to the whole database and restrict others from access to sensitive portions, such as the salary field in a personnel file. Users can open the database file, look up the information they need, and (if they have the necessary access privileges) print or change it.

Obviously, creating an efficient multi-user database requires planning:

- **Put the file where it changes most.** If a data-entry person most often makes changes to the file, locate the file on that person's Mac.

- **Run reports from the host.** If you generate reports with the database program that require it to find, sort, or calculate data, try to use the host Mac (where the files are stored) to run your reports.

The Next Steps

Sharing files, exchanging messages, and making database information available to everyone will make your business more productive by improving communication and efficiency; it'll also whet your appetite for getting even more out of your network. You'll realize that you can easily share other peripherals



By sharing databases, everyone can use the same info, with access to changes.

besides printers — a fax modem, perhaps, or a tape drive or optical-disc drive for performing network backups (see "Building a Data Safety Net," in this issue). As your network gets busier and you begin pushing the limits of the strategies we've discussed here, you'll start thinking about getting a server and faster wiring (see the "Becoming Server-Savvy" and "What Cost, Ethernet?" sidebars). These steps require an investment of time and money, but they're likely to bring you substantial productivity gains and long-term cost savings.

For now, start simply; the strategies described here will give you a solid head start. But also start saving your pennies for those productivity-boosting next steps. You may be ready for them sooner than you think! ☞

Shelly Brisbin is a MacUser associate editor who tinkers with networks . . . for fun?

wiring, find out whether that wiring contains four wires instead of just the two that LocalTalk requires. If it does, you can use your existing wiring for Ethernet. If it doesn't, you'll have to have your offices wired for Ethernet.

The cost of wiring a small office for a 10BASE-T network isn't particularly high. Unless you're a wiring expert, however, you'll want to hire a professional to do your installation. You should plan all wiring to minimize unnecessary cabling and should thoroughly test it before you begin to use your network.

Adapting to Ethernet

The good news is that Ethernet adapters are not very expensive. You'll probably pay between \$100 and \$250 per Mac. You need a free NuBus or PDS slot in each Mac you plan to put on the network. If you want to put slotless Macs on your network, you can use an adapter box that plugs in to your Mac's SCSI

port; the SCSI approach isn't quite as speedy as NuBus Ethernet, but it's still a definite improvement over LocalTalk.

Hubby Considerations

Ethernet networks, unlike the LocalTalk variety, can't simply be wired together in a daisy-chain or backbone configuration. You must use a hub, sometimes called a concentrator. A hub sits in your phone closet and is connected to each Mac on the network via ports and cabling; its job is to manage network traffic, moving it efficiently from source to destination.

Hub prices start as low as \$400 for an eight-port hub with no management features built in. When choosing a hub, divide the price by the number of ports you get, to figure out your price per port. If you want sophisticated software to manage your hub's traffic flow and keep track of activity on the network, you'll pay lots more.

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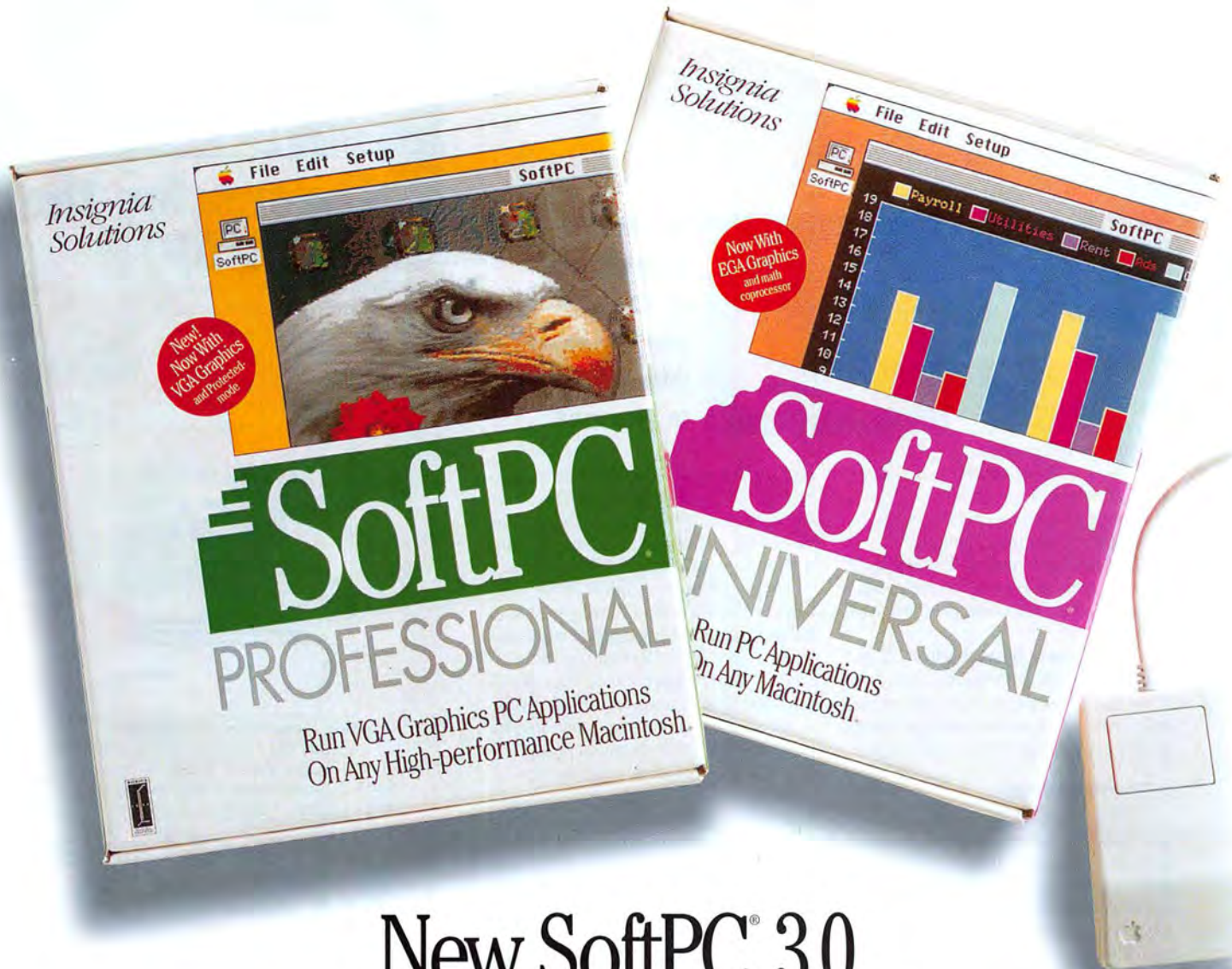
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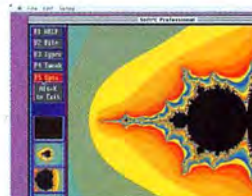
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CIRCLE 154 ON READER SERVICE CARD.

Cross-Platform Shopping



What to look for — and what to look out for — when you're buying software to run on all the machines in your office.

By John Rizzo

“Now, this one's a real beauty,” the salesman says in a voice that vies with his loud plaid jacket for my attention. “Recently upgraded, comes stock with OLE and DDE . . .” He stops abruptly, spotting my PowerBook. “Of course, we have a Mac version too,” he adds, with all the political correctness of a restaurant owner who's just added a parking space for the handicapped.

Welcome to the wonderful world of cross-platform shopping — that is, shopping for software that runs on Macs *and* on other platforms or operating systems such as Windows or UNIX. It's a buyer-beware kind of place, full of pitfalls that include monoplatform salespeople, difficult-to-convert data, and creeping Windowization of previously dependable Mac applications.

I took to the floor at a Comdex trade show in Atlanta with the express purpose of honing some strategies for smart cross-platform shopping. A trade show is a good place to do comparison shopping — particularly if you like to buy from mail-order companies — but those who wisely prefer to avoid the crowds can use many of my strategies when buying from local software dealers.

Demo Dos and Don'ts

The first thing you should know is how to control a product demo. I say “control” rather than “attend” because a savvy software shopper should control the demo, not be led by the

software rep (or salesperson or friend) who's demonstrating the software. Having some control over a demo is particularly important when you're looking at cross-platform products, where it's easy for someone to gloss over tricky compatibility questions.

Without further ado, some dos and don'ts:

- **Don't rely on canned demos.** At trade shows, I never attend the big group demos where they toss out mouse pads to a cheering audience. Instead, I get a one-on-one (or at least a one-on-four) demo at a nearby demo station, where I can make sure the demonstration addresses cross-platform issues.

- **Do look at both versions.** Make sure you see both the Mac and the PC (or UNIX) versions. Software vendors often say, “They're both the same,” but check out both versions anyway. “Both the same” can mean different things — and they're not always good things, as I'll explain later.

- **Don't rely on one demonstrator.** Try to get a demo of each version from someone who really knows it; I often discovered that the person giving a demo knew one of the platforms very well but basically guessed about the other.

- **Do count steps in a task.** Ask the demonstrator to show you the exact sequence of steps involved in the tasks you care about. Notice how many steps it takes to accomplish these tasks — remember, fancy graphics on a screen don't necessarily mean that the product is easy to use. And don't be afraid to ask if you can try the product out for yourself.

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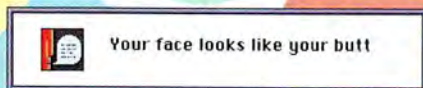
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• **Don't assume file compatibility.** Any cross-platform application worth its weight in floppies should have a file format that both Macs and PCs can read — or a built-in translator to convert between the two. Because conversions aren't always picture perfect, ask to see what actually happens when you open a file with two different computers — including whether all elements of the file can be edited in the converted version.

• **Do compare features.** Check that the feature sets for both versions are similar; otherwise, you or your in-house tech-support staff will have to learn essentially different products for each platform. However, expect differences in cases where one platform has capabilities that the other doesn't. Crippling one version for the sake of cross-platform consistency doesn't do users a lot of good — although some vendors seem to think it's the way to go.

Trends to Watch Out For

Unfortunately, there's a trend of going overboard on *convergence* — that is, making the two versions absolutely identical. Often this means sacrificing capabilities that are one platform's strengths and just going for the least common denominator. For example, the Mac version of Lotus Notes doesn't take advantage of the Mac's graphics capabilities — not even basic graphics such as boxes around database fields. Instead, fields

are indicated by the caret (>) character. A fancy splash screen with giant buttons takes a lot of screen real estate, but once you get into a database, it's almost like using DOS.

Other programs use a Windows interface on the Mac, just for the sake of platform correctness.

Some programs use a Windows interface on the Mac, just for the sake of platform correctness. No doubt this helps Windows users work on Macs, but it can confuse the heck out of Mac users.

No doubt this helps Windows users work on Macs, but it can confuse the heck out of Mac users. A good example is DeltaPoint's DeltaGraph Pro 3.0, scheduled for release this fall. The program now has a Windows tool bar at the top of the screen and a status bar at the bottom (à la Excel), both of which are immovable wasters of screen real estate — and you can't turn them off (at least not in the beta version I

saw). This space wasting is especially annoying in a graphics program such as DeltaGraph. The new version also removes the x, y coordinates from individual windows, instead using the status bar to display the coordinates for the currently selected window. This change is a step backward (older Mac programs did it this way) as well as a more confusing method if you have multiple windows open. And there are now iconic buttons *everywhere* — in the tool bar, in the status bar, and in the windows themselves. For Mac users, the learning curve is much steeper than it was before.

I spotted Windows-itus in varying degrees all over the show floor at Comdex. National Instruments' LabView 3.0 has

What to Look For in Cross-Platform Software

Compatibility. Each version should be able to read the other versions' files, either by using a binary-compatible file format or via a built-in translator.

Similar feature sets. Both versions should allow you to do the same things, although not necessarily in exactly the same way. Features should be implemented in a manner appropriate to each platform.

Support for OS features. Each version should support appropriate platform-specific operating-system features. Mac applications in general should support System 7 features such as QuickTime, Macintosh Easy Open, and AppleScript. Upcoming versions of Mac graphics software should support QuickDraw GX, and upcoming connectivity software should support AOCE.

Platform-appropriate interfaces. Interfaces should use the best features of each platform, not the least common denominator.

Multiple-network support. Connectivity products should support network protocols for both or all platforms (such as AppleTalk, IPX, and/or TCP/IP).

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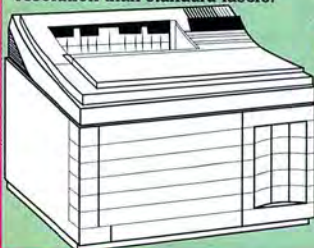
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given up its innovative floating tool palette, which let you select tools from the keyboard as well as with the mouse, and replaced it with a fixed tool bar that isn't accessible from the keyboard. You're now forced to use multiple mouse clicks as you toggle among icon bars to accomplish certain tasks.

Adobe Acrobat, a new cross-platform document creator and reader, is an example of software that should support System 7's Balloon Help but doesn't. Instead, the program requires you to open a help file every time you want to find out what a button does. Better is DeltaGraph's status-bar help, which displays a button's function when you pass the cursor over it. However, the constant flickering of changing text as you move the mouse can be annoying.

Spotting System 7 Shirkers

Of course, lack of support for Balloon Help is just the tip of the iceberg where System 7 shirking is concerned. When you're looking at cross-platform software, check whether the Mac version supports all the System 7 features you're going to want. Macintosh Easy Open is an important feature when you work with files from other platforms, because it helps you open files for which you don't have the creator application (see "Apple Opens Up," July '93, page 191). Look for AppleScript support if you want to automate interapplication tasks. Also, make sure that any connectivity software you buy will support AOCE (Apple Open Collaboration Environment) and that graphics applications will support QuickTime and the new QuickDraw GX (which adds many new graphics and typography features). And if you're looking for cross-platform video and animation, make sure the Windows version of the software supports QuickTime for Windows — it's generally superior to Microsoft's Video for Windows, which is not cross-platform.

You can't necessarily fault vendors who haven't yet implemented some of the newer System 7 features (AOCE and

QuickDraw GX are too new to be supported yet), but watch out for vendors who have decided not to implement them at all. Some have opted instead to support Windows features with Mac add-ons from Microsoft

— which is why an installation of a Microsoft application for the Mac now puts more than 2 megabytes of Windows operating-system software into your System Folder.

Microsoft's Windowization strategy involves eventually replacing pieces of the Apple operating system with Microsoft pieces: OLE in place of publish-and-subscribe, DDE in place of Apple

events, MAPI in place of AOCE, and ODBC in place of DAL. Microsoft is trying to persuade software developers to make their applications compatible with the Windows feature set (and the Windows interface) in the name of cross-platform compatibility.

The problem with the Windows add-ons for the Mac is that they're not efficient, because they're not as closely tied to the core operating system as are Apple's System 7 extensions. They're also not currently supported by most Mac applications. The only Windows extension that adds anything special for Mac users is OLE, which is basically a more powerful publish-and-subscribe. However, Apple is getting ready to release Amber, its own multiplatform document-linking standard, which is likely to get more support from Mac application developers than OLE will.

As for supporting System 7 features in its own applications, Microsoft is lukewarm. I asked several Microsoft reps, including product managers and public-relations people, if Microsoft's applications would support AOCE and got answers ranging from a flat "no" to "we're looking at it."

Does this mean you should avoid Microsoft products like the plague? No, not if they're the best products for what you want to do (Word is still my favorite word processor, for example). But make sure you know which System 7 features

Watch out for vendors who have decided not to implement new System 7 features in the Mac versions of their software. Some have opted to support Windows features with Mac add-ons from Microsoft — an inefficient approach.

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they support and which ones they don't, so you know what you're giving up.

The Right Stuff

Fortunately, Windowization and System 7 shirking aren't the only trends in

cross-platform software; there's good news as well. One of the positive forces is Symantec's new Bedrock software-development environment. In Bedrock, developers write just one core program; Bedrock automatically adds Windows

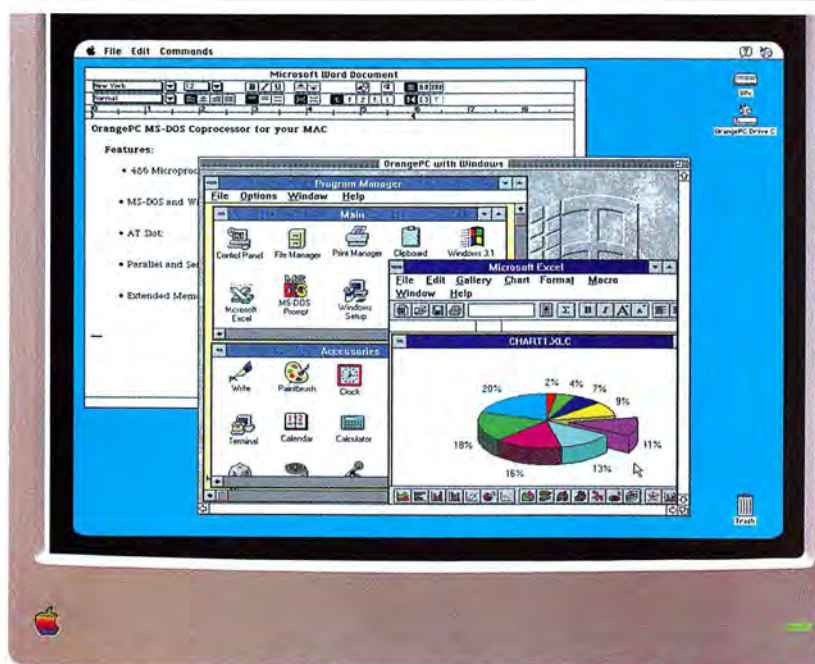
interface features such as tool bars and status bars to the Windows version and Mac features to the Mac version. Bedrock also adds appropriate operating-system features for each platform.

Applications developed with Bedrock haven't yet reached the market, but you can find currently available applications that have avoided the pitfalls and created exemplary cross-platform implementations. One of the best is FileMaker Pro, from Claris. The Mac and Windows versions have the same features, with neither platform getting shortchanged, and users of either version can access the other over an AppleTalk or IPX network. The interface of the Windows version is virtually identical to that of the original Mac version, which is simple, elegant, and intuitive — without violating any Windows conventions. PC users aren't complaining either, as evidenced by rave reviews in the PC press.

Another commendable cross-platform product is Macromedia's MacroModel 1.5, the hottest 3-D drawing program on the Mac and the only cross-platform spline-based modeler available. MacroModel was designed from the ground up as a cross-platform application. Although it's among the most powerful modelers around, it's also the easiest to use. Most actions require only two steps: Choose a tool, and then click and drag to create 3-D objects or to stretch, bend, or twist them. You can also type in numbers for precision modeling. The Windows version is tailored to make Windows users feel at home, with Windows-like icons and a status bar, whereas the Mac version has Mac-appropriate equivalents.

On my way out of the show, I was lucky enough to catch a demo of the ultimate cross-platform product — Voyager's A Hard Day's Night. The entire Beatles movie is squeezed into a QuickTime movie (and QuickTime for Windows) on a CD-ROM, along with commentary and other movie clips. The simple, HyperCard-like interface is exactly the same on both platforms, yet it doesn't look out of place on either. Sometime later this year, there will no longer be two versions but rather a single disc that runs under both the Mac operating systems and Windows. You can't get much more cross-platform than that!

John Rizzo, a *MacUser* technical editor, is the author of *MacUser Guide to Connectivity*, published by Ziff-Davis Press.



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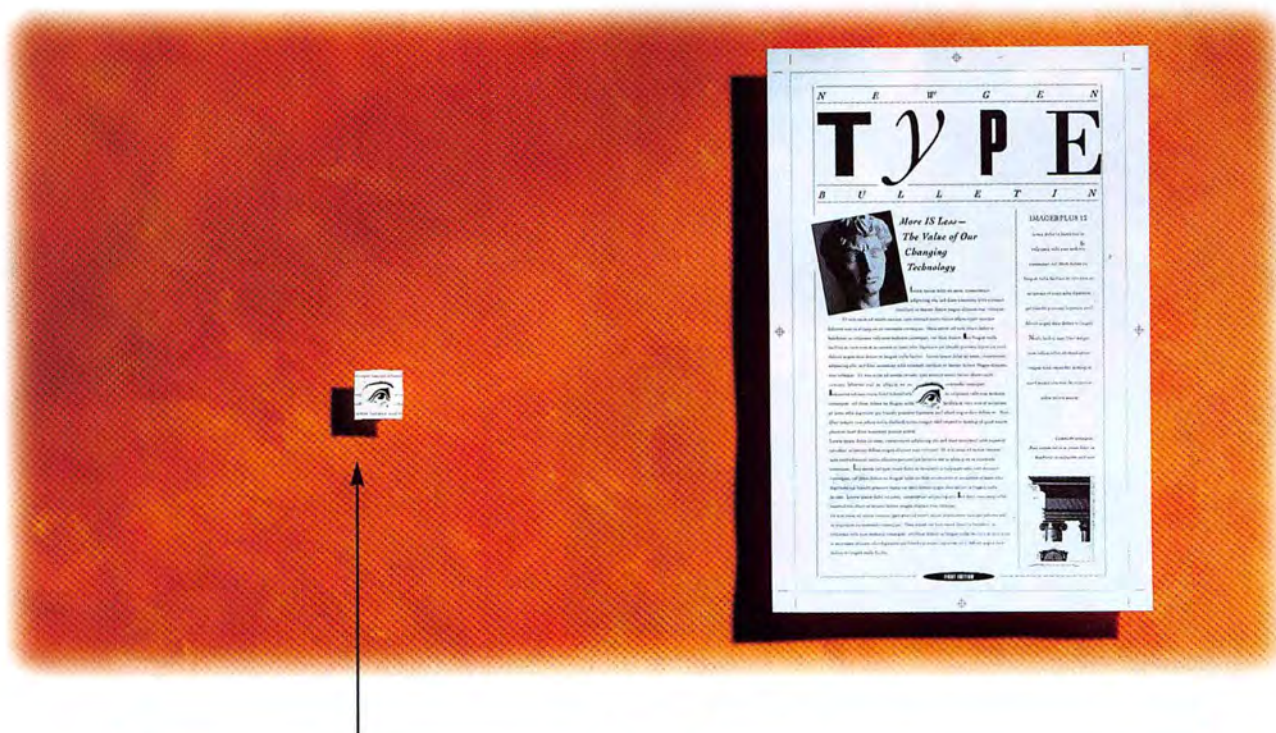
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By Victoria von Biel

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Double-Duty Databases

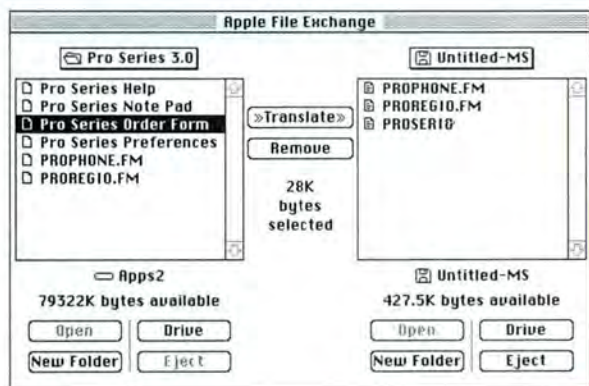
Mac and Windows users can now share the same FileMaker Pro database. Here's what you need to know to make sure both platforms see the same thing.

By Gregory Wasson

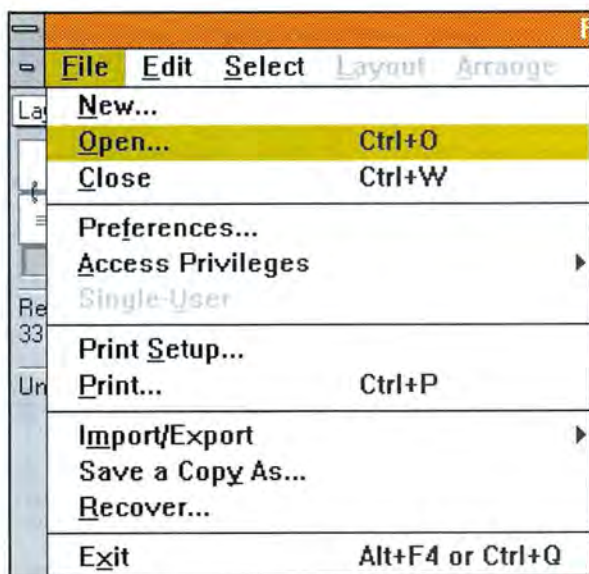
Claris is currently offering a Windows version of its popular flat-file-database program, FileMaker Pro, which, oddly enough, amounts to great news for Mac users. Now you can use the same FileMaker Pro database in a mixed Macintosh/Windows office or over a network and still feel right at home: FileMaker Pro is virtually the same whether you're

dealing with it on Platinum Gray or Big Blue.

But despite the nearly complete transportability of FileMaker Pro files across the two platforms, there are some techniques and caveats Mac users should keep in mind when designing a database that will be shared by Macs and Windows PCs. Here are seven of the most important rules:



1



2

1. Use DOS Naming Conventions

One of the biggest problems when Windows and Mac users access the same FileMaker Pro database is filenames. Mac users can call their files just about anything they want. When you try to bring these files over to the PC, however, problems erupt, because the PC environment, even under Windows, is far more persnickety about what you call your files. You have to limit yourself to the DOS convention of a filename of eight or fewer characters followed by an optional three-character-maximum extension that usually identifies the application that created the file.

There are several ways to transfer Mac FileMaker Pro database files to a PC-formatted floppy disk. One way is to use the Apple File Exchange (AFE) program, which comes with your system software. When AFE finds a file with a name that would be unacceptable in the DOS or Windows environment, it simply shortens the filename to eight characters. In Figure 1, AFE ran into trouble, because the first four filenames all start with the same eight-character sequence. It named the first one PROSERI& but choked on all the others except for the two files — PROPHONE.FM and PROREGIO.FM — with which we had already used DOS filenames conventions.

The moral? Insist that users on your network or in your mixed environment follow DOS filenames conventions, whether they're working on a PC or a Mac. Your database setup will come to a crashing halt if you don't make this an implacable rule.

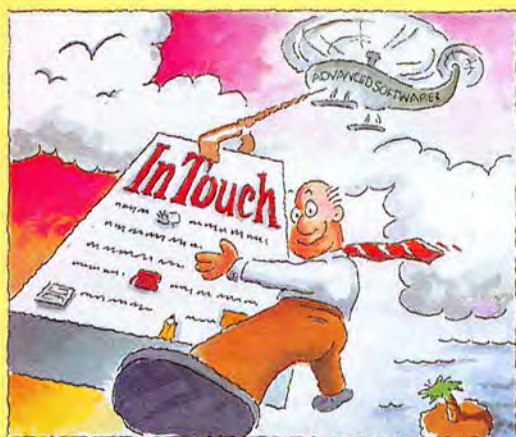
2. Add Menu Shortcuts

Most Mac users rely on keyboard shortcuts for such common operations as Open and Quit to streamline their work. Unfortunately, the pull-down menus in FileMaker Pro for Windows have few of the shortcuts Mac users take for granted. And the ones that are there, such as Alt-F4 for Quit, aren't familiar to Mac users. Fortunately, you can add the common Mac shortcuts to Windows — just remember that the Control key subs for the Mac's Command key.

To add shortcuts, turn on the Show Mac Accelerators option. Here's how: On the PC, open the CLARIS.INI file (it's located in the Windows directory) in a text editor such as Notepad. Use the Find command to locate the line that reads "Show Mac Accelerators=NO." Change the NO to YES, and you're all set. FileMaker Pro's menus (such as the one in Figure 2) will now display some common Mac commands.



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3

3. Ban Chicago

One of the most common fonts in the Mac world is Chicago. It pops up everywhere on the Mac — from menus to button labels. Mac database designers naturally tend to use the Chicago font in layouts and reports, but that's not a good idea if the database is going to be used in both the Mac and Windows environments.

Because there's no Windows equivalent to Chicago, if a Mac FileMaker Pro database containing Chicago is used on a Windows machine, users will see such things as clipped text (as in Figure 3) and truncated button labels, which can disfigure a layout so badly that novices might find it difficult to use the database at all. Not to mention that it just plain *looks* bad.

So when you're designing a database, choose a big, bold font that is available on both platforms, such as Helvetica Bold. Or remap the Windows font-substitution table so that you get an appropriate substitution for Chicago on Windows machines.

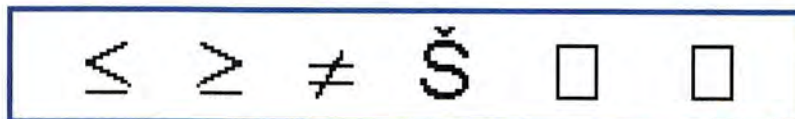


4

4. Remap Essential Fonts

It's not always possible to use fonts in your layouts that are available to all computers on your network. One way around this problem is to remap. To do this, open WIN.INI on your PC in a text editor such as Notepad or in SysEdit and use the Find command to search for the section called [FontSubstitutes]. Enter the unavailable Mac font on the left, an equal sign, and the Windows font you want to use instead on the right. (If you don't specify a substitute font, Windows will automatically select a substitute for you that you may not like or that isn't appropriate. Most Windows machines automatically use Arial as the substitute font for Helvetica.)

Another option is to standardize on either TrueType fonts or Type 1 fonts with Adobe Type Manager for both environments. The same font might be available in Type 1 on one platform and in TrueType on the other, but the kerning and width values of the fonts can differ subtly, causing spacing problems in layouts.



5

5. Avoid Custom Characters

Although Windows computers and Macs can share the same fonts, these fonts may not have the same characters available on both platforms. The fonts will have the basic ABCs, of course, but more esoteric items — the greater-than (>) or equal (=) signs or fractions — may not appear on both platforms or may not correspond to the same keystroke. Steer clear of odd characters, especially those accessed via the Option key. If you *do* need to use an unusual character in a layout (as a design element, perhaps, or as a field label), create it in a graphics program and then insert it as a graphic.

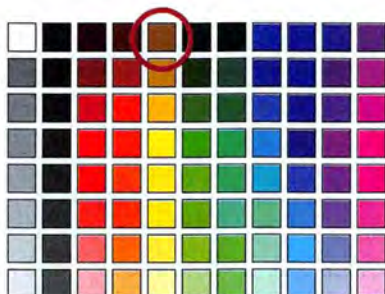
OUTLINE SHADOW OUTLINE SHADOW

6

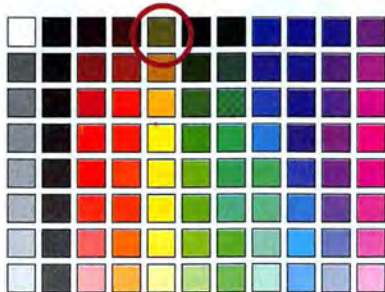
6. Avoid Shadow and Outline Fonts

A couple of popular Mac styles, outline and shadow, aren't supported in FileMaker Pro for Windows: They'll simply drop out and the text will appear in a plain face.

If you must use outline and shadow, create styled text in a Mac bit-mapped-graphics program and then incorporate the text as a graphic in your layout. Use an image-manipulation program such as Adobe Photoshop, and you will have anti-aliased text that won't look half bad.



7a



7b

7. Beware of Layout Snafus

When you design a FileMaker Pro database to be used on both Windows PCs and Macs, you'll find that layout elements often don't quite match on both platforms — colors may drop out, lines may not meet, or fields may be too small for the text they enclose. The mismatched elements probably won't affect the way your database operates, but they will change how it looks (as in Figure 7a).

Color mismatches occur because the FileMaker Pro color palettes for the Windows version are close to but not exactly the same as the Mac version's color palettes. Both versions' palettes have 88 colors, most of which are identical, but a few don't come close. In Figure 7b, for example, the fifth color (counting from the left) in the first row in the Mac palette (top) is clearly brown whereas the Windows equivalent is more olive green. In most cases, such color discrepancies won't mean a lot to users, but it's a phenomenon to be aware of in cases where it might make a difference.

Don't use the full 88-color palette in a layout unless all the computers that will use the database are capable of displaying 256 colors or more. Otherwise, vital colors will be unattractively dithered or may even drop out of the layout altogether. If one or more of your computers can display only 16 colors, switch your Mac to 16 colors when you design the database so you don't use colors that other users won't have.

Gregory Wasson is a *MacUser* contributing editor and the author of the *MacUser Guide to Shareware*, published by Ziff-Davis Press.



AMERICA'S TOP 50 CD ROM TITLES

Here's the definitive "A" list of top CD ROM titles in heavy rotation among desk jockeys from coast to coast. MacUser's mouse-rated reviews cover a variety of interests: education, reference, multimedia games, adventure and more. Disks are rated on originality, ease of use, and their ability to keep the user's interest. This report is in time for the holidays, and in tune with how MacUser makes buying easier.

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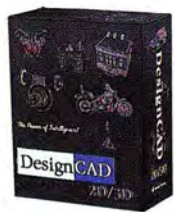
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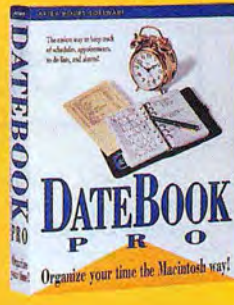
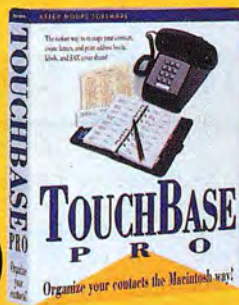
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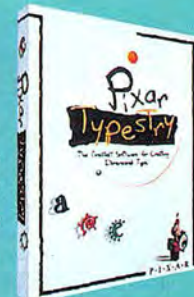
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FON0482



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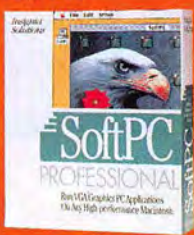
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Publisher: Insignia Solutions
COM0141



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Fractal Design Painter X2

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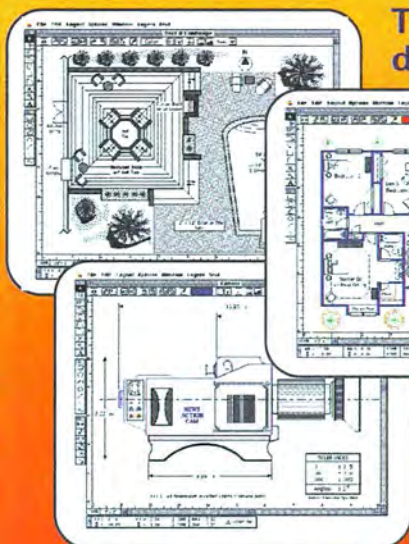
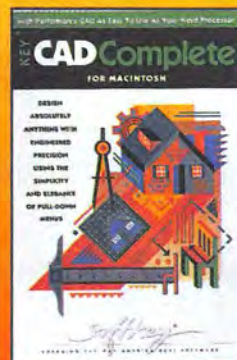
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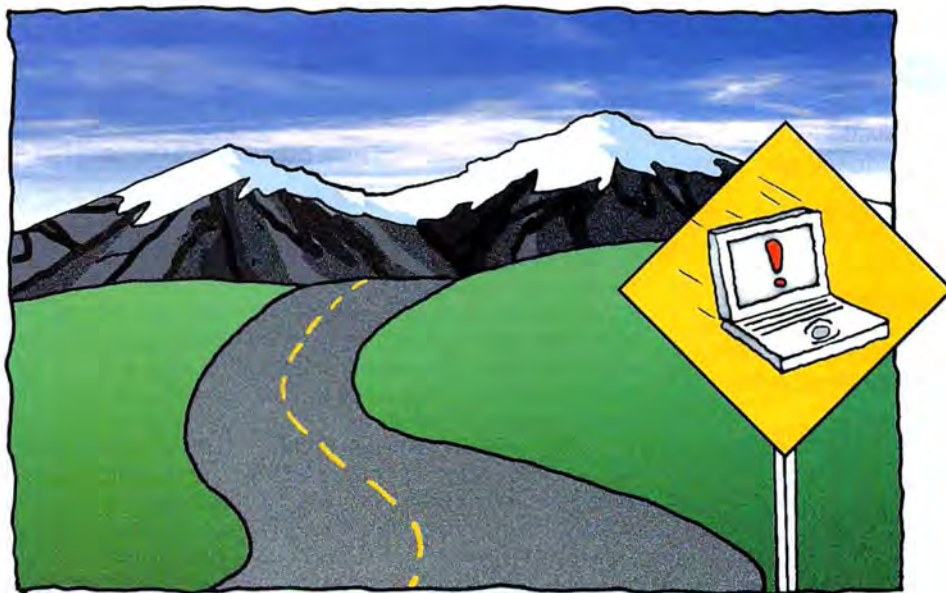
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Upgrades Ahead



So you thought accelerators and other upgrades were just for desktop Macs? Wrong! There are at least a couple of new ways you can speed up your PowerBook.

By Sharon Zardetto Aker

Not many computer users subscribe to the “if it ain’t broke, don’t fix it” philosophy. After all, even if it ain’t broke, it can still be upgraded. Accelerators, FPU’s, DSP cards, and other goodies galore are designed to beef up desktop Macs. But very little is available for PowerBooks — you can’t swap your 160’s passive-matrix screen for an active-matrix one, retrofit your 170 so it can address 14 megabytes of RAM, or adapt your 165c so it can slide into a Duo Dock.

In fact, until recently, PowerBook owners had to be content with the most basic of upgrades, such as adding more memory, installing a bigger hard drive, or buying a faster modem. Now, however, if you own a PowerBook 140, 145, or 160 and you’re overwhelmed by the urge to fix what ain’t broke, you can speed it up by adding an FPU and/or upping the speed of the CPU. But before you whip out your credit card, ponder this: Do you really *need* an FPU or a faster processor in your PowerBook?

Transcendental Computation

An FPU, or *floating-point unit*, is the math coprocessor that handles transcendental math functions. If that brings to mind nothing more than the Beatles and their Maharishi, just think of it this way: When a lot of computation is going on, it’s easier for the main processor to hand the task off to a chip that’s specifically designed to handle math with floating-point

numbers. This coprocessor, although more narrow in its abilities than an all-purpose processing chip, performs its limited repertoire much more quickly.

What constitutes “a lot” of computation? It’s more than just the obvious calculations going on in a big spreadsheet. The behind-the-scenes calculations needed to figure out how your 3-D image in a CAD program should look when you rotate it 30 degrees are computation-intensive, as is the use of some Photoshop filters (Photoshop itself doesn’t require an FPU, however).

But do you use Photoshop or a CAD program on your PowerBook? Most people do word processing, presentations, communications, and spreadsheet calculating with their PowerBooks, and only the last task benefits from an FPU: Microsoft Excel recalcs two to three times as fast with an FPU as it does without one.

Processor Elimination

The only difference between the PowerBook 140 and the 145 that replaced it is the processor speed: The 140 runs at 16 megahertz and the 145 at 25 megahertz. So faster is not only better but it’s also important, right? Well — you can have a definite *maybe* on that.

All the current PowerBooks run at either 25 megahertz or 33 megahertz. Granted, 25 megahertz is about 50 percent faster than 16 megahertz and 33 megahertz is almost a third

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faster again. But where's the speed gain? If the bulk of your PowerBook work is word processing, you're not going to type any faster and you probably can't read as fast as the window can scroll. So the computer will still be waiting for you — only it will be waiting faster.

That's not to say that you won't see an immediate difference: Programs will launch faster, for instance. But faster CPUs have the option of running in Power-Saver mode, at 16 megahertz, to conserve battery power. I can't tell at which speed my 170's running unless I check the setting; the last time I looked, it was running at 16 megahertz.

For the four popular PowerBook uses, the only place a boost in processor speed seems to make a real difference is for presentations involving QuickTime movies or other animations.

Upgrade? And How?

At the risk of sounding like a Luddite, I'm not making any blanket recommendations for increasing clock speed and adding FPUs. Two general guidelines: If you use QuickTime, increase your processor speed; if you use Excel, get an FPU. If you don't fall into either of these

categories, think twice — or thrice — before shelling out three or four hundred bucks for something you might not need. And remember that these are *general* guidelines: Maybe saving a few minutes a day while using Excel is worth hundreds of dollars to you, but maybe it isn't.

Think twice before shelling out three or four hundred bucks for something you might not need.

OK, say you've decided to go for it. Apple doesn't offer an upgrade path, but as usual, third parties have come to the rescue. Shreve Systems

(800-227-3971 or 318-424-9777) and Digital Eclipse (510-547-6101) each offer an upgrade for the 140 that includes an FPU and a CPU-clock-speed boost to 25 megahertz. At \$299, Shreve's price is \$100 less than Digital Eclipse's, but Digital Eclipse includes shipping to and from the company and a full-year parts-and-labor warranty, compared with Shreve's three-month warranty. Digital Eclipse also offers other upgrades (FPU and 33 megahertz for the 160; FPU for the 160 and 145), and I like the company's attitude: It even supplies the shipping box.

How do Shreve and Digital Eclipse perform their miracles? The FPU addition isn't all that miraculous, actually. The 140/145 board's design is basically the same as the 170's, and the 160's is

PowerBook Secrets: Upgrade Your Batteries

Each generation of PowerBooks has called for more power: the 160 and 180 with their video-out capability, followed by the 165c with its color, double-backlit screen. And guess what? With each new generation, Apple has quietly upgraded both the capacity of its NiCad (nickel cadmium) batteries and the capability of the AC adapter. So if it's time to replace your batteries or adapter, make sure you get the latest models — you'll get longer-lived batteries and faster charging, even for an older PowerBook.

The original 2.3-ampere-hour NiCad battery is labeled 140/170, only to differentiate it from the 100's lead-acid battery; its model number is 5417. Second-generation batteries (model number 5653) are rated at 2.5 ampere-hours, and the latest batteries (model number 5654) are rated at 2.9 ampere-hours. Buy the latest battery, because for the same price, you get longer-lasting power — about 20 percent more from the second battery than from the first, for example. If you can't order by part number at a dealer, just say that you have a 165c and you need the right battery for it.

The PowerBook's AC adapters have changed along with the batteries. The first model, the M5140, is only 15 watts; the second design, the M5651, is 17 watts; and the third design, the M5652 (also marked 24W on the plug), is a 24-watt model. Older PowerBooks can use the newer adapters, and if you're buying a second adapter, you should get the latest design — your battery will charge faster. Although a newer PowerBook can use an older adapter in a pinch, you may find that its battery won't charge — or might even slowly discharge — if you have an external monitor attached to the PowerBook.

— Rich Wolfson

the same as the 180's. Because the 170 and the 180 both have FPUs, there's no problem adding an FPU to the 140, 145, or 160.

Changing the CPU speed involves a little more work, because swapping the PowerBook clock crystal for a faster one isn't always enough; sometimes the CPU can't work at the increased speed. When that's the case, Digital Eclipse puts in a new CPU chip. It also tests other components to make sure that everything's working up to speed (so to speak) and adds a heat sink, because the faster clock speed makes the PowerBook work up a little more of a sweat. Everyone I've talked to, though, assures me that the heat sink is just extra insurance, because the PowerBook is rated to cope with the extra speed. Even so, the folks at Digital Eclipse don't take the 140 to 33 megahertz — they know it can take the 25-megahertz strain, because the 170 does; they're sure the 160 can take the 33-megahertz strain, because the 180 can, but they don't push it beyond that. Anyway, the one-year warranty should ease any worries — to some extent.

And speaking of warranties, remember that these upgrades void your Apple warranty. That may not be much of an issue if your PowerBook is nearing its first birthday. In fact, Digital Eclipse's customers have reported that they received Apple warranty service for unrelated problems after a Digital Eclipse upgrade; it's not clear whether the Apple servicepeople were even aware of the upgrade. But don't count on kindness or understanding: This type of alteration absolutely voids your warranty, even if the upgrade is an FPU and the problem is a dead internal floppy drive.

More Dynamic Duos

There are a couple of other upgrades to consider too. Although neither Duo model has an FPU, nor is there room for one, the Duo Dock has a socket just waiting for one. This is an Apple-sanctioned — and planned-for — upgrade, but you don't have to get it from Apple. The FPU (a Motorola 33-megahertz 68882) is available from most chip vendors and costs only around \$65; the installation is relatively simple, with the hardest part being opening the Dock.

And what about the poor PowerBook 100, beloved by those who own it but limping along at 16 megahertz with its 68000 chip and no FPU? Well, nothing

is available yet, but Digital Eclipse has an upgrade under consideration that may be in research and development even as we speak. How would you like a 33-megahertz 68030 chip in your 100 so you can sneer at the slow, overweight

models? If you're interested, contact Digital Eclipse; enough interest may spur the R&D along. ☞

Sharon Zardetto Aker and Rich Wolfson are co-authors of *The PowerBook Companion*.



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How to Buy

Fonts

■ Which font technology — **TrueType or PostScript**

— should you standardize on? Both are outline-font technologies (meaning that the fonts are stored as a set of mathematical descriptions) and can be printed at virtually any size and still look good. TrueType is Apple's outline-font technology; PostScript fonts were originally developed by Adobe but PostScript-clone fonts are now manufactured by other font vendors.

■ Standardize on PostScript fonts if you'll be sending files to a **service bureau** for printing; consider standardizing if you use a PostScript printer. Some older PostScript printers may take longer to print TrueType fonts.

■ If you use PostScript fonts, you will need to install **ATM (Adobe Type Manager)**, an extension that gives you better-looking type on-screen.

■ Standardize on **TrueType** fonts (which are generally cheaper than PostScript fonts) if you won't be sending output to a service bureau (most of which have PostScript fonts installed) or if you work in an office with Macs as well as PCs, because most PCs use TrueType fonts. For a good selection of **high-quality, low-priced fonts**, check out the \$99.95 Microsoft TrueType Master Set for Macintosh, which comes with 102 TrueType fonts for the Mac, including the 14 system fonts in Windows 3.1.



*Want to build up your font library
but don't understand all the available options?
Here's a quick guide to font basics.*

■ If necessary, you can translate TrueType fonts to PostScript and vice versa, using a **font-modification utility** such as FontMonger (Ares Software) or Metamorphosis Professional (Altsys).

■ Make sure you have a **font-management utility** such as Suitcase II (Fifth Generation Systems) or MasterJuggler (ALSoft). These utilities let you open sets of fonts only when you need them rather than having them loaded permanently in the System Folder, which can eat up memory and slow down application launching.

■ Low-priced fonts are often copies of well-known high-priced fonts and may not be well designed. You probably don't need the highest-quality fonts if you're printing only letters, memos, and informal reports, but you also may **run into problems**,

such as characters that won't print, with poor-quality fonts.

■ When you're **evaluating a font**, look at samples of small and large sizes (6 point and 24 point, for example) and see if the characters are legible and regularly formed at each size. Serifs (the cross-wise strokes at the ends of letters in fonts such as Palatino and Times) should be fine and unbroken. Letters should have smooth contours and fit together well, without large gaps between them.


■ A good way to quickly build up a large font library is to buy collections of fonts on **CD-ROM**. For a price as low as \$30, you get a CD-ROM containing hundreds of fonts, some of which are instantly accessible but most of which are locked until you've called the vendor and bought an access code to unlock some or all of them. This option makes

the most sense if you need many fonts at your disposal or if you already have a CD-ROM drive.

■ When buying a CD-ROM, shop for the vendor that gives you **the best price** on font unlocking rather than on the basic CD-ROM itself. Confusingly, although the font foundry (rather than the company that sold you the CD-ROM — a mail-order house, for example) gives you access to the fonts, the access price depends on which company you bought the CD-ROM from in the first place.

■ As convenient as a CD-ROM collection is, **access to locked fonts** may not be instantaneous. You may have to wait for as little as a couple of minutes or as long as 24 hours to receive an access code to your locked fonts.

■ Shop around for fonts. Even expensive designer collections **cost less** if you buy them from mail-order outlets or font houses such as FontHaus (800-942-9110 or 203-846-3087) or Precision Type (800-248-3668 or 516-864-0167). It's worth paying a little more for good support, though: Some font sellers are willing to give you advice on selecting and using fonts.

■ For **more on buying fonts**, see "Fonts on Demand," May '92, page 165. Another good source is *Stop Stealing Sheep* (\$24.95), from Adobe Press (415-961-4400), 1993. 

By Victoria von Biel

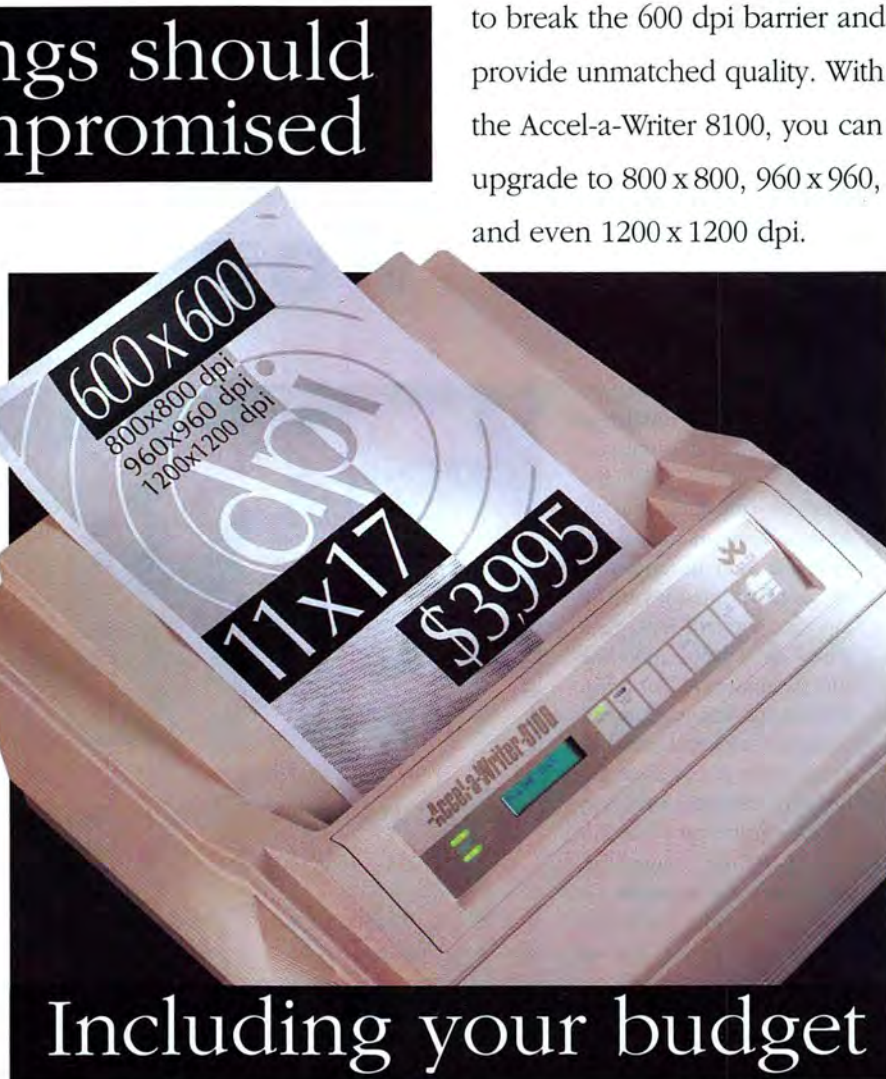
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CIRCLE 126 ON READER SERVICE CARD.

Upgrading the

Mac Classic

*Here's how to get a little more power
out of Apple's first low-cost Mac.*



The stock Classic came with a 40-megabyte internal hard drive. **Higher-capacity drives** are available from several companies, with prices from \$200 to \$500 for 80-megabyte to 240-megabyte drives. Don't spend too much time comparing various hard drives' access speeds (often measured in milliseconds). Classics are unable to work at top speeds, so most low-priced drives will do just fine.

To go beyond the Classic's built-in 1 megabyte of RAM, you'll need a special 1-megabyte **RAM-expansion card**, which has two 1-megabyte SIMM slots. Apple sells expansion cards for \$109 apiece, and they're available from third-party memory vendors for \$60 to \$75 each (check the back pages of this magazine for companies). Add two 1-megabyte SIMMs (around \$30 apiece) to the expansion card to take the Classic to its maximum of 4 megabytes.

You can take your Classic to Ilci speeds and beyond with an **accelerator**. DayStar Digital (800-962-2077 or 404-967-2077) has a PowerCache adapter (around \$45) for its line of 68030 Universal PowerCache cards (\$400 to \$850). NewLife (800-663-6395 or 613-592-9738) offers a 16-megahertz 68030 NewLife Accelerator! card (\$465 with FPU, \$600 with video option). Each card includes RAM slots, which take the place of the Classic's expansion card. These slots can use four 4-megabyte SIMMs, letting you add as much as 16 megabytes of RAM to your Classic.

The Mac Classic was Apple's first response to the demand for a low-cost Macintosh. With its 8-megahertz 68000 processor, 1 megabyte of RAM on the logic board, and optional 40-megabyte hard drive, it marked the first time Apple actually *downgraded* its current level of technology to put out a new product.

In many ways, the Classic is a throwback to the Mac Plus and earlier models: It has no natural means for expansion

(besides RAM), it has the same basic CPU as the original Mac 128K, and its all-in-one construction discourages do-it-yourself upgrades.

If you do want to perform an internal upgrade yourself, you will need a 9-inch or longer T-15 Torx screwdriver, a 1-inch carpenter's spring clamp (or a tool with the most unfortunate of names: a Mac cracker), a grounding strap, some type of alligator-clip grounding wire, and a flat-head screwdriver (for

By Tom Petaccia

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POWER TOOLS THE MAC WORKSHOP

grounding purposes). You'll also need the hands of a surgeon and the patience of Job. Apple never intended you to get inside a Classic and, in fact, voids any warranty or AppleCare coverage you may have if you do so. Unless you are technically skilled or a bit adventurous, you may just find it a lot easier to pay your local authorized Apple technician the one-hour charge to install upgrades for you.

The Classic was Apple's first response to the demand for a low-cost Mac. Apple actually downgraded its current level of technology to put out the new product.

For those who'd like to add an external black-and-white monitor, many accelerators — the DayStar and NewLife products, for example — have a video-out option. Monochrome monitors cost \$500 to \$1,000, depending on brand and size. SCSI-based video options, which let you connect a monitor via the SCSI port — such as ScuzzzyGraph, from Aura Systems (800-241-2872 or 619-438-7730) — are available as well, but they are painfully slow.

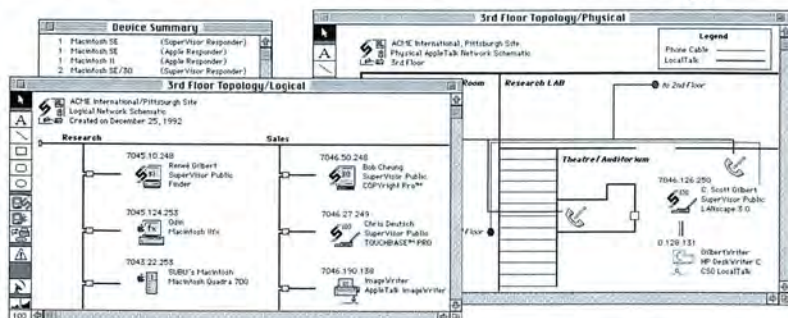
Classic trivia: Many Classic owners aren't aware that their machines have System 6.0.3 embedded in ROM. You can access this system software by pressing Command-Option-X-O at startup. Use the older system software to occasionally troubleshoot possible system-related software problems; however, Apple does not recommend that you use this system software full-time.

Is it worth upgrading your Classic? Probably not, beyond the basic steps of adding more RAM and a larger hard drive. To boost speed, you'll spend around \$650; to add video-out capability, you'll have to shell out \$100 to \$200 plus the cost of a monitor.

Rather than upgrading, check out a new Mac, especially as the street price of a brand new Classic II is about \$900 nowadays and you may be able to find a Color Classic for about \$1,100. And don't forget the new Performa models, which cost \$1,200 to \$1,500, including the monitor.

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TIP SHEET

Nobody ever said you had to live in Cupertino to be a Macintosh expert. Know-it-alls are everywhere, from Manhattan to Malibu — even in Waldport, Oregon, where we found our own Mac guru, Philip Russell. Each month Phil shares his own tips plus the best from the 70-odd Macintosh-user-group (MUG) magazines he reads each month. But Phil can't do it alone. To those whose undocumented Mac tip *MacUser* prints, we pay \$25, and the Reader Tip of the Month earns \$100.



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Gregory Wasson at 72511,36. Be sure to include your full name and mailing address along with the text of the tip.

By Philip Russell

Reader tips compiled by Gregory Wasson

■ For those who like to use keyboard shortcuts for menu items, **Now Utilities 4.0.1's** NowMenus makes it easy. Just select the menu item, and while holding the mouse button down, press the shortcut keys you want to use. For example, to make a keyboard shortcut for the Make Alias command on the Finder's File menu, select Make Alias, hold the mouse button down, and press the shortcut keys you want to use (Command-M, for example). The key command will now appear in the File menu.

■ If you're still a **System 6.0.x** user, haul MultiFinder out of the System Folder, park it on the desktop, and set your Mac to start up to the Finder. When you want to use MultiFinder, press Option-Command-double-click. (Thanks, AppleJac Digest.) If you have On Cue, from ICOM Simulations, install MultiFinder as an application on the On Cue menu. Now specify the Finder in Set Startup. When you want to use MultiFinder, select it from On Cue.

■ You can select objects within a group in a **FreeHand 3.11** document without ungrouping them. Option-click on an object, and you'll be able to resize it, move it, or

change the fill and line characteristics. Hold down the Control and Option keys to dig through the layers to get to the desired object.

■ Here's a quick way to produce a **list of folders** or documents in a folder. Select all, and copy. In any word processor, paste. The titles of the folders and documents will appear. However, this method lets you grab only the first 255 characters, so check the name of the last item in the folder to make sure it appears in your printout.

■ If you keep fiddling with column widths in **Excel 4.0** to get them just right, you can stop now. Simply select the column or columns you want to adjust, and then double-click on the right margin of the rightmost selected column. All the columns will instantly adjust to exactly the space needed for the longest row entry in each selected column.

■ You can easily include a map of your **HyperCard** stack, consisting of miniature pictures of key cards, in the stack. Hold down the Shift key when you paste a copied card onto the map page. The result is a minicard. Overlay the minicard with a transparent button. Script the button to take you to the real card.

■ When you're dragging a line or a text block from left to right across a **PageMaker** screen, the Toolbox or some other palette sometimes gets in the way. Drop your cursor down low on the screen, and continue dragging. When you let go, your line or text block will end exactly at the horizontal location your cursor reached when you let go of it.

■ To duplicate styled text in **PageMaker**, copy a word in the style you want and paste it where you want to duplicate the style. Highlight the word, and start typing. Your new text will conform to the style of the copied text.

■ Thinking of **printing** on legal-sized paper (8½ x 14 inches)? Think again. When I select legal-sized for a PageMaker (any version) document, my LaserWriter Plus Print dialog box shows that I can print to 85.76 square inches of the sheet of paper. When I select letter-sized paper, the Print dialog box shows that I can print to an area of 86.4 square inches. Strange but true — you can get more print area on a sheet of normal letter-sized paper than on a sheet of legal paper. Check the Print dialog box to see what area your printer lets you print to.

Excel 4.0: Take Note



To add a hidden Cell Note, click in the cell you want to annotate, go to the Formula menu, select Note, and type your note in the Text Note box. Click on OK when you've finished. The cell will now have a dot in its upper right corner. To see the hidden note, double-click on the cell. If you have a Mac with a microphone (built in or not), you can record a sound note while you're in the Cell Note dialog box.

■ The width of a **space** when you press the space bar depends on the font, size, and style you're using. That's why you should *never* use the space bar to line up text in columns on a page. Use the indent icon in the ruler for paragraph indents, not the Tab key or the space bar. Use tabs for columns. Use the centered option for centering material.

■ Here's an easy way to print a **TypeStyler 1.5 or 2.0** logo at good resolution on a non-PostScript printer. Make the logo four times the desired size in TypeStyler. Export it as a PICT, and then shrink it to one-quarter of its original size in your target document. This will approximate 300 dpi when you print.

■ If you have a paragraph in **Word 4.0** or later with superscripts in some lines, the leading may be uneven because of the superscripted characters. Use Option-space bar to place a space in superscript style at the end of each line that doesn't contain superscript characters. This will even out the leading for the entire paragraph.

Reader Tips

System 7 Application Menu

You can automatically hide the current application by Option-clicking in any other window. To hide the current application and reveal a hidden one, hold down the Option key and then choose the hidden application from the Application menu.

Bryan Wu
New York, NY

Excel 4.0

Do you want Excel to add up the timings on a tape or a CD? Or the total number of hours put in by a part-time worker? Excel won't let you add hrs:min or min:sec (try it) unless you use the following formula:

```
=TEXT(SUM(INT((SUM(A3:A5)*24))*100)+(MOD(SUM(A3:A5)*24),1))*60,"#0:00")
```

Replace A3:A5 both times with the appropriate cell ranges from your spreadsheet, and make sure that all the quote marks are dumb (straight).

Michael Gibson
Westfield, NJ

DeltaGraph Pro 2.0.2

Eliminate the overlapping that can occur between the starting scale values on the vertical and horizontal axes of a DeltaGraph 3-D graph (see Figure 1). First position the arrow cursor on an offending scale value. Click once to select the graph, wait a moment, and click again to select the group of scale values that holds the unwanted value. Wait another moment before clicking again to select the individual scale value (if you click too quickly, the axis-label dialog box will open). Select Hidden from the Text

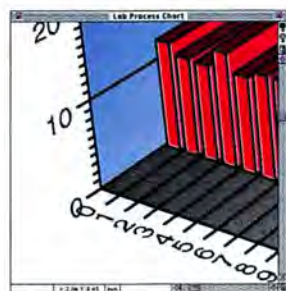


Figure 1: Plagued by overlapping values in a DeltaGraph Pro 3-D graph, as shown here? By using the Hidden command on the Text menu, you can easily fix the problem.

Tip of the Month: FileMaker Pro

FileMaker Pro is great for storing pictures, but because it has a 32-megabyte file-size limit, a database of stored graphics can break that limit quite easily.

However, when storing QuickTime movies, FileMaker Pro stores only a 3K *alias* to the original movie file, so the file size grows only slightly. By using the QuickTime application

ConvertToMovie, you can convert the PICTs you want to store into single-frame "movies." Use FileMaker Pro's Import Movie command to place the alias in the database. One advantage to this approach is that the screen redraws much faster.

Kim Hunter
Mission Viejo, CA

menu, and the offending text will disappear.

Dan Kuchera
Waterloo, IA

System 7 Desktop

If you like to avoid using the mouse, press Command-D to get to the desktop without clicking on the Desktop button in the standard Open dialog box.

Stephen E. Maas
West St. Paul, MN

QuarkXPress

Here's one way to speed up the spell-checking procedure in QuarkXPress (for another method, see Tip Sheet, April '93, page 249): Use the shareware product WindowShade to completely hide the document (except for its title bar). This still leaves it available for a spelling check. This method requires no screen redraw whatsoever, even when you're checking several pages or spreads. The same technique should work in other programs. [WindowShade is available in the ZiffNet/Mac Download & Support Forum as file WISHAD.SIT in the Extensions library. — Ed.]

Jeff Negran
New Brunswick, NJ

Word 5.1

Word 5.1's Annotation feature is useful if you're working on a document with several people. However, there's no built-in keyboard shortcut for inserting a comment once you've written it, so you have to mouse up to the Insert button in the Annotation window,

which wastes time. Here's a workaround:

After you've written your comment, press Escape and Return in quick succession. Escape brings up a dialog box that asks you if you want to save changes in the annotation (even if you've only just entered it). Because the default choice is Yes, pressing Return instantly inserts your comment, without your having to mouse around. You must have the Text Annotation command module installed in order to add annotations to a document.

Arnie Keller
Victoria, BC
Canada

If you want to proofread a document on-screen but the type is too small, you can jump up your type size for the whole document even if it includes different-sized fonts. Rather than selecting a specific size from the Font menu, select the entire document and then press Command-Shift and the > (greater than) key to increase the type size to the next available size for each point size in the document: 10-point type becomes 12-point, 18-point type becomes 24-point, and so on. Remember how many times you pressed the > key.

When you've finished, select the entire document again and press Command-Shift and the < (less than) key the same number of times, and your text will return to its original point size.

David Fitzjarrell
West Jordan, UT

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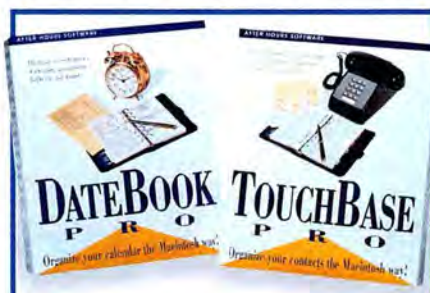
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 12320 *Director Ver. Up. from 3.0* .. 175. 12321 *2.0* .. 369.
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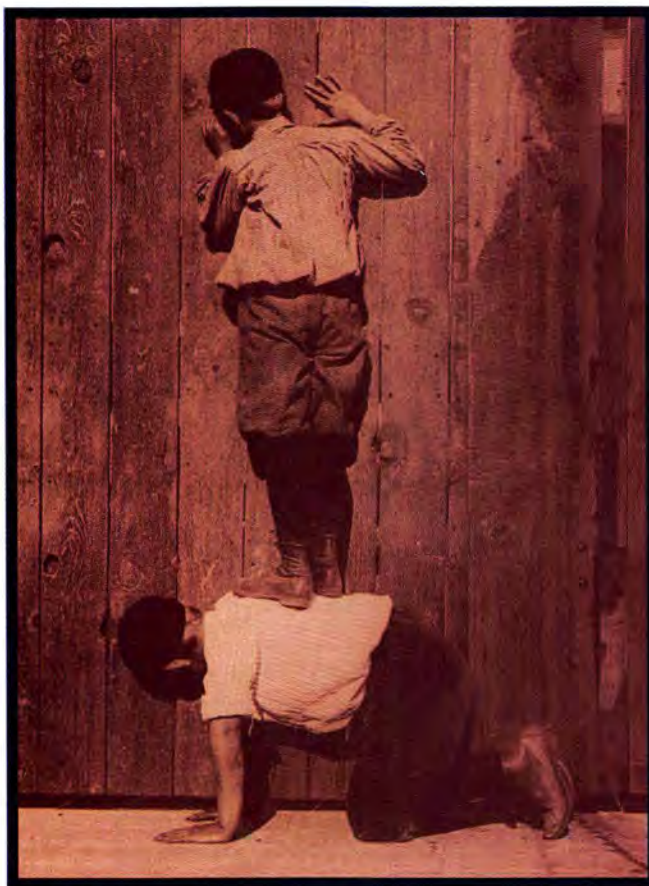
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HELP FOLDER

Questions, anyone? Here's where to get answers from the experts. Bob LeVitus and Andy Ihnatko are the authors of the best-selling *Dr. Macintosh's Guide to the On-Line Universe*. Andy Ihnatko is also a longtime activist with BCS•Mac. They're ready to answer your questions

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how to sign up.

**By Bob LeVitus and
Andy Ihnatko**

Bob: In the May issue (page 252), I said I didn't know of a utility that could extract the outline fonts from your printer's ROM and that even if there were such a beast, it would probably be illegal. Fortunately, several readers did know of one: Metamorphosis Pro (\$149), from Altsys (214-680-2060). I still don't know how legal it is, although I suspect that copyright law allows you to extract the outline fonts from a printer's ROM for use with that same printer.

In Leaving Color

Q. Is it me, or was my old Mac SE/30 actually *faster* than the shiny new LC III I bought to replace it? I know that the III is supposed to be several times faster, but when it's running certain applications (ZTerm and FileMaker Pro especially), it seems to be lagging.

Ann Stevens
Shreveport, LA

Andy: Well, I haven't actually met you, Ann, so I can't comment on that end of your question, but I'm guessing that either (a) your SE/30 had a lot more memory than your

new LC III does — more elbow room almost always yields higher speed — or more likely (b) you're seeing the magical performance hit of color video.

You're probably used to the SE/30's built-in black-and-white (1-bit) video. When you switched to a color system (probably instinctively setting your monitor to display as many colors as possible (256 colors, let's say), you unknowingly made the task of putting a dot on the screen eight times as taxing for your Mac. So, when you use applications that rely on being able to put a lot of information on the screen quickly, it's disappointment city.

This is especially noticeable when you're using a telecom program. Most of what ZTerm does is shovel text onto the screen as fast as the modem can ladle it into memory. To recoup the speed loss, either buy a video-accelerator card (buckage maximum) or simply use the Monitors control panel to lower your video depth before entering those applications in which the slowdown bugs you the most. Or download Victor

Tan's neat shareware control panel DepthMaster, available from user groups and on-line services. Once you've configured it, DepthMaster automatically changes the screen depth as you launch your fave applications and switch in and out of them.

Bob: Even though I have a wicked-fast Mac and Super-Mac Thunder 24 video accelerator, I generally work in black-and-white unless I actually need color. Like for a game or something.

If you use CE Software's QuickKeys 2, you can use its ScreenEase extension to create a single-keystroke macro for each color depth you use. On my Mac, Control-Shift-1 switches the monitor to black-and-white, Control-Shift-2 switches to 256 colors, and Control-Shift-3 switches to 16.7 million colors.

Maximum Overdrive

Q. I have a IIx with an internal 40-megabyte hard drive, and I want to expand my hard-disk space. I know I can either buy an external hard drive or replace my internal drive with one of higher capacity. If I choose the second

*... But Were Afraid to Ask

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Q. Could you tell me about a folder called Rescued Items from HD80 that appears every now and then in my Trash? (HD80 is the name of my hard drive.) When I open it, there's really nothing in there that I can identify.

Buddy Bradley
Seattle, WA

Andy: If you think what I think you think — that System 7 keeps an eye peeled for files on volumes that have gone south and sticks them into a special folder — you're *kind of* right. System 7 has an invisible Temporary Items folder, which is where applications are supposed to stash any temporary data files they create. For instance, if you've just typed ten pages' worth of information in a word processor but haven't saved it yet, your word-processing application will probably stash

everything in a temporary file. Applications are supposed to delete these files automatically when they're no longer needed — when you quit the program, for example.

If either the program or your system crashes, those temp files will remain intact. When the Finder sees those files hanging around at shutdown or startup, it senses that something must be amiss. It valiantly makes those temporary files visible, creates a Rescued Items folder in the Trash, and moves those puppies into that folder.

Here's the upshot: Whenever there's a crash of some stripe and you realize that you foolishly didn't save your work, dive into the Trash and look for the Rescued Items folder. You may very well find all your work right there waiting for you.

Two final comments: Emptying the Trash destroys Rescued Items folders, so yank that data outta there promptly. Second, if the data within were of any real value, it would've been worth saving in the first place, wouldn't it?!

POWER TOOLS HELP FOLDER

option, is there a device that will let me use the old 40-megabyte drive as an external? And where does the SCSI ID reside — on the drive or on the motherboard?

Curt Geiger
Oldenburg, IN

Andy: Personally, I prefer externals, because each has its own power supply, so that when one drive wipes out, it doesn't take your Mac down with it. But if you want to slap in a new internal drive, there's no problem putting the old drive on external life support. Just grab your MasterCard, call the people at Casa Blanca Works (415-461-2227), and order one of their external SCSI enclosures. For \$88, you get a box the size of a large Whitman's chocolate assortment; \$85 buys you something a little more portable. Pocket enclosures for housing former PowerBook drives are also available, for \$60 and up. All enclosures include Drive7 Lite, a slightly limited version of Casa Blanca's popular universal formatting utility.

Installing a drive in these enclosures is a piece of cake. Chonk in three cables (SCSI, power, and one for selecting the SCSI ID — yes, it's on the drive and not on the Mac), and then tighten four screws to hold it in place. Quick and simple, and it won't look half as bad as the drive I built five years ago.

Bob: I also prefer adding drives externally. I recommend that you leave the 40-megabyte drive inside your Mac (or order an external SCSI enclosure as Andy mentioned) as a spare. Move everything — System Folder, applications, and data files — to the new external drive; it's probably faster than your old internal drive. Keep a minimal System Folder on the internal drive so that if anything goes wrong with your big new external drive, you can boot

from the internal drive and get on with your work. As long as you have a good backup, you can restore anything you need to the internal drive and continue working while the external drive is in the shop.

If you decide to purchase an external enclosure and feel like comparison-shopping, you should know that Alliance Peripheral Systems (APS) also sells a wide range of enclosures, starting at \$79. Bracket kits for internal drives cost \$29 and up. You can reach APS at 800-874-1434 or 816-478-8300.

Kustom Kolors

Q. Although System 6 users are relentlessly bashed and heckled in these pages, I am (in defiance) still using System 6.0.5 — and with good reason: I haven't heard of a System 7 utility that even comes *close* to what Kolor does for System 6. Using Kolor [a freeware program available from ZiffNet/Mac (filename KOLOR.SIT) — Ed.], I can totally customize the color of menus, menu bars, buttons, scroll bars, and more. I have spent painstaking hours selecting soothing colors for my work environment, so the thought of a white menu bar with black letters sends chills down my spine and has honestly prevented me from converting to System 7. Who can give me back my color control if I make the switch?

Jeff Negran
New Brunswick, NJ

Bob: I was able to find not one but *two* programs that let you totally customize your work environment (see Figure 1). One of them — and it's been around for a long, long time — is ClickChange 2.0 (\$89.95), from Dubl-Click Software (800-266-9525 or 818-888-2068). The other is Now Fun (\$69), from Now Software (800-237-3611 or 503-274-2800). Each includes

tools for customizing your desktop pattern, changing cursors, and playing sounds. ClickChange gives you more ways to customize buttons and scroll bars and includes menu-bar icons and a clock; Now Fun can display any picture on your desktop and includes a screen saver that runs After Dark modules and comes with more than two dozen of its own modules. Either program provides hours of Mac-customizing fun.

Andy: Personally, I think cosmetic emendations such as these are best implemented with ResEdit. That way, the pinheads in middle management can't restore the status quo quite so easily.

Font Redundancy

Q. I've just installed System 7.1 and noticed that it has a separate Fonts folder for all TrueType and PostScript fonts. So do I still need Suitcase? It seems redundant, and I sure could use the extra memory.

Art Vanderlay
New York, NY

Andy: I think Suitcase (translation: a \$79 third-party system extension that manages fonts that aren't physically installed inside the system) is still a handy utility if you deal with a hefty number

of fonts. Suitcase is from Fifth Generation Systems (800-873-4384 or 504-291-7221).

Most folks have a small core collection of fonts they use each day and a larger number of fonts they open up every now and then. Under unadorned System 7.1, when it's time to compose your Star Trek fanzine and you need your Klingon and Next Generation fonts, you have to drag them into your Fonts folder to activate them. With Suitcase, you just open the control panel and click on your Star Trek font set. All the necessary fonts are activated, and you don't have to restart your Mac. If you keep *all* of your fonts active *all* the time, you will surely tax your Mac's resources. Trust your Uncle Andy on this one.

Bob: A font-management utility is a good investment if the ability to load and unload fonts at will without all that unsavory dragging appeals to you. It appeals to me. But I switched from Suitcase to MasterJuggler (\$49), from AL-Soft (713-353-4090), which gives you most of Suitcase's font-management and conflict-resolving abilities and also includes a file launcher, a sound manager, and several other bells and whistles you don't get with Suitcase.

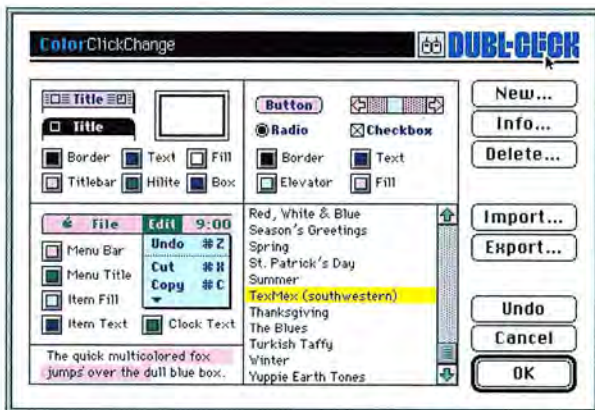


Figure 1: For a more tastefully decorated desktop, try ClickChange 2.0. It lets you customize your Mac environment until you're blue in the face.

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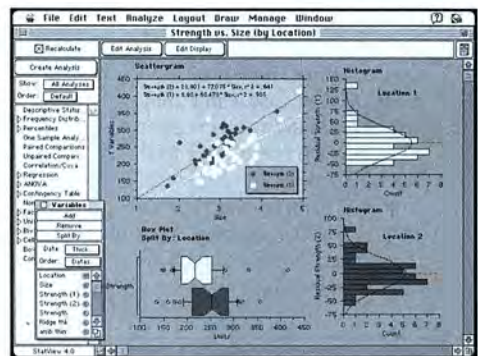
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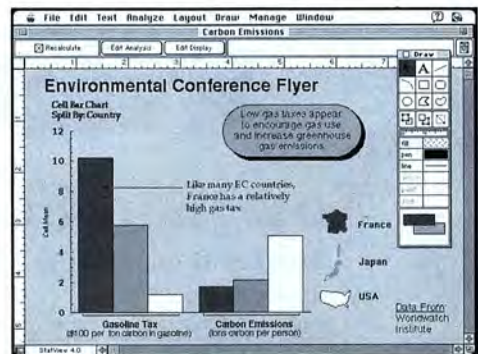
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CIRCLE 79 ON READER SERVICE CARD.

Andy: Aw, phlbht to file launchers and sound managers; I have yet to see anything in the former category (MasterJuggler included) that works better than a hierarchical Apple Menu Items folder (OK, Square One, from Binary Software, is neat). Anyway, I've tried MasterJuggler and I think Suitcase offers a simpler interface for font manipulation.

Bob: A simpler interface? What have you been drinking, Andy? Suitcase has one of the worst user interfaces I've ever seen. It's confusing, confounding, and contrary. Besides, Suitcase can't play my Arnold Schwarzenegger sounds when I restart ("I'll be back!") or shut down ("Hasta la vista, baby"), and it can't play Meg Ryan screaming "Yes! Yes! Yes!" when I launch an application. MasterJuggler's

interface certainly won't win any prizes, but it's more intuitive than Suitcase's.

Word Crash

Q. What is the interrupt button on my Mac for, anyway? If I press it after a crash, I get a cursor, but what do I do from there? The reason I ask is that every so often, my Mac crashes after I use Word's spelling checker. I usually save before I spell-check, but sometimes I forget and lose it all. Is there any way I can recover after such a crash?

Keith A. M. Duff
Wheaton, IL

Bob: That check-the-spelling-and-crash-into-oblivion thing used to happen to me all the time too. Then I increased Word's memory allocation from 1,024K to 2,048K, and

now I rarely crash when I invoke the spelling checker. Just single-click on the Microsoft Word icon in the Finder; go to Get Info, on the File menu; and then change the preferred size to 2,048K. (Note: Preferred Size was known as Application Memory Size in system versions prior to 7.1.)

As to recovering from a crash, the first thing to try is the forced quit. If your Mac freezes, press Command-Option-Escape. You should see a dialog box asking if you want to force Word to quit and reminding you that unsaved changes will be lost. Click on the Force Quit button. If you're lucky, Word will quit and you'll be able to save any files that were open in other applications. As soon as you've done so, restart. Your Mac is in an unstable state



Figure 2: If you know a little programming code, you can use the mysterious interrupt button — the one on the right — to exit crashed programs.

after a forced quit; restarting sets things right.

Because you asked about the interrupt button (see Figure 2), here's another thing you can try if you freeze or crash.

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Press the interrupt button, type SM 0 A9F4, and then press the Return key and type G 0. This doesn't succeed as often as the forced quit, but it's useful sometimes as a last resort.

Andy: If you want to impress passersby, download and install Apple's MacsBug (filename MACSBU.SIT, available in ZiffNet/Mac's Download & Support Forum in Library 14). It's a sophisticated low-level debugger for propellerheads that pops up whenever a crash occurs or the interrupt button is pressed. It has two advantages: It offers one or two easily remembered commands for getting out of crash situations, and because it's just a big screen full of numbers, it makes you look as if you *really* know what you're doing. Trust me, a screen full of MacsBug data

is good for at least 15 minutes of goofing off while you "contemplate" the problem.

Someday My Prints Will Come

Q. There are a couple of things we don't understand about our new NEC Silent-Writer 95 laser printer. First, it claims to have 2 megabytes of RAM, which makes the constant "out of memory" errors seem a bit strange. When we used a PostScript-download utility, less than 350K was available as free memory. Is this typical?


We also don't understand the six-pages-per-minute speed claim. We seldom see our first page any sooner than two or three minutes after we've triggered the Print command.

Don and Rita Gillespie
Vancouver, WA

Andy: Two megabytes of printer RAM is borderline; for most medium-duty PostScript printing, you need at least 4 megabytes if you want a sporting chance that pressing Command-P will actually result in a printed page. If you do get an "out of memory" error, though, you might be able to get around the problem by shutting off the printer and then turning it back on again. This wipes your printer's memory clean and usually causes your next print job to go right through. The best solution is to pony up the bucks for a memory card and upgrade your printer to at least 4 megabytes.

As for speed claims: *Six pages per minute* means that it takes the printer ten seconds to grab a sheet and whip it through the paper path *after* it's processed the information

to be printed, which, as you've found out, can take a while. NEC uses a somewhat poky microprocessor, and now that the market's flooded with wicked-fast RISC-based printers, older printers tend to be left in the dust.

Bob: Remember that a RAM upgrade for your NEC printer means getting proprietary SIMMs currently available only from NEC at outrageously high prices (\$199 for 2 megabytes and \$399 for 4 megabytes). Fortunately, rumor has it that several mail-order vendors have cloned the NEC RAM board and will be offering their versions at much lower prices, probably by the time you read this. Look for this RAM in any ad for a mail-order outlet. Just be very, very careful that you get a money-back guarantee. 

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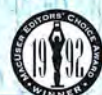


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CIRCLE 26 ON READER SERVICE CARD.

Budget-Software Guide

It's said that 80 percent of users take advantage of only 20 percent of a program's features. If so, why pay for the 80 percent you're not using? Rather than shelling out for a top-of-the-line commercial product, you may find that by checking out user groups and on-line services (such as ZiffNet/Mac), you'll discover a streamlined shareware or freeware program that provides all the power you'll ever need. Although professional work probably requires a high-powered commercial program (which includes technical support and extensive documentation in its price), anyone with simpler needs can assemble an excellent stable of low-priced software by tapping the thriving Mac shareware market.


Use the "Shareware Alternatives" table as a starter shopping list as you investigate shareware alternatives. All these freeware and shareware programs are available from ZiffNet/Mac. 

Table 1: Shareware Alternatives

Category	Commercial product	Shareware	Pros	Cons
Drawing application	Canvas (Deneba, \$399), MacDraw Pro (Clarisc, \$399)	StudioCraft (STUDIO.SIT, Library 1), \$35	Provides Bézier curves and text manipulation. Elegant and easy to use.	No plug-in tools.
Low-end painting application	MacPaint (Clarisc, \$125)	LightningPaint (LPAINT.CPT, Library 1), \$14; for students, \$7	Large selection of tools, options, and special effects.	Can create only monochrome pictures.
Personal information manager	Dynodex (Portfolio Systems, \$89.95), TouchBASE (After Hours Software, \$125)	Address Book (ADDRBK.SEA, Library 1), \$30	Highly customizable and configurable. Variety of print formats. Supports phone dialing.	Somewhat complicated interface. Almost overwhelming array of options.
Screen saver	After Dark (Berkeley Systems, \$49.95), Pyro! (Fifth Generation Systems, \$39.95)	Dark Side of the Mac (DARKSI.CPT, Library 1), free	As an application, not an extension, avoids compatibility problems.	Has fewer, and less elaborate, modules than After Dark. Requires System 7.
Spreadsheet application	Excel (Microsoft, \$495), Lotus 1-2-3 (Lotus, \$495)	Mariner (MARINE.CPT, Library 1), \$40	3-D worksheets. Supports on-sheet graphics and charts, formulas, and cell formatting.	Can import only text files. No macros or color support.
Telecom application	MicroPhone II (Software Ventures, \$195), Smartcom II (Hayes Microcomputer Products, \$149)	ZTerm (ZTERM.CPT, Library 1), \$30	Supports all CIS download protocols. Has simplified dialing and downloading.	Lacks sophisticated scripting capability.
Text editor	Vantage (Baseline Publishing, \$99.95), Nisus (Nisus Software, \$395)	BEdit Lite (BBLITE.SEA, Library 1), free	Supports plug-in extensions. Offers grep search-and-replace. Grep expressions can be saved for later use.	No rulers, macros, or font and style formatting.

FREE!

MAKE YOUR OWN ICONS

Thumbnail, this month's *MacUser* utility, lets System 7 users preview graphics files right on their desktops. Simply by dragging a graphics file onto Thumbnail, you turn its Finder icon into a scaled-down rendition of the file's contents — Thumbnail automatically creates an anti-aliased icon for the file. Based on these thumbnail previews, you can tell whether a 10-megabyte file named Untitled contains a scan of your neighbor's cat or the fruits of your attempts to prove yourself the Pablo Picasso of the digital era, without having to launch your graphics application and open the mystery file. If you want to select a portion of the graphic to use for the icon, holding down a modifier key as you drag a file onto Thumbnail lets you isolate just the part you want. You can process files en masse by dragging multiple files and folders onto the application.

Thumbnail supports a variety of graphics file formats, including PICT (with or without QuickTime compression), TIFF, JPEG,

CompuServe GIF, MacPaint PNTG, and PostScript EPSF (if the file was saved with a PICT preview). It can also create a custom icon based on the first frame of a PICS file or the poster frame of a QuickTime movie.

Thumbnail is the brainchild of Robert Mah, author of Window-Ranger, the May '93 *MacUser* utility. Based in New York City, Robert also helped create the commercial personal-finance program WealthBuilder, from Reality Technologies. You can contact Robert on ZiffNet/Mac at 76437,320.

Thumbnail is available exclusively on ZiffNet/Mac and from AppleLink's ZiffNet Selections. ZiffNet/Mac members can download Thumbnail free of connect-time charges until August 25, 1993, by typing GO ZMC:POWERTOOLS. After that, you can find the file THUMB.N.SIT in Library 3 of the MacUser Forum (GO ZMC:MACUSER). If you're on AppleLink, look for it in ZiffNet Selections:MacUser Software:Utilities.

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Model	Internal	External
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Micropolis 2112 mechanism

APS F 1.2G⁵ 1149 1249
Fujitsu M2266 mechanism

APS Q 1225⁵ 1199 1269
Quantum 1225P mechanism

APS MX 1240³ 1499 1569
Maxtor MXT1240S mechanism

APS MS 2.4G⁵ 2599 2699
Micropolis 1924 mechanism

APS MS 3.0G⁵ 2999 3099
Micropolis 1936 mechanism

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APS 120 ¹	349	299	429 [†]
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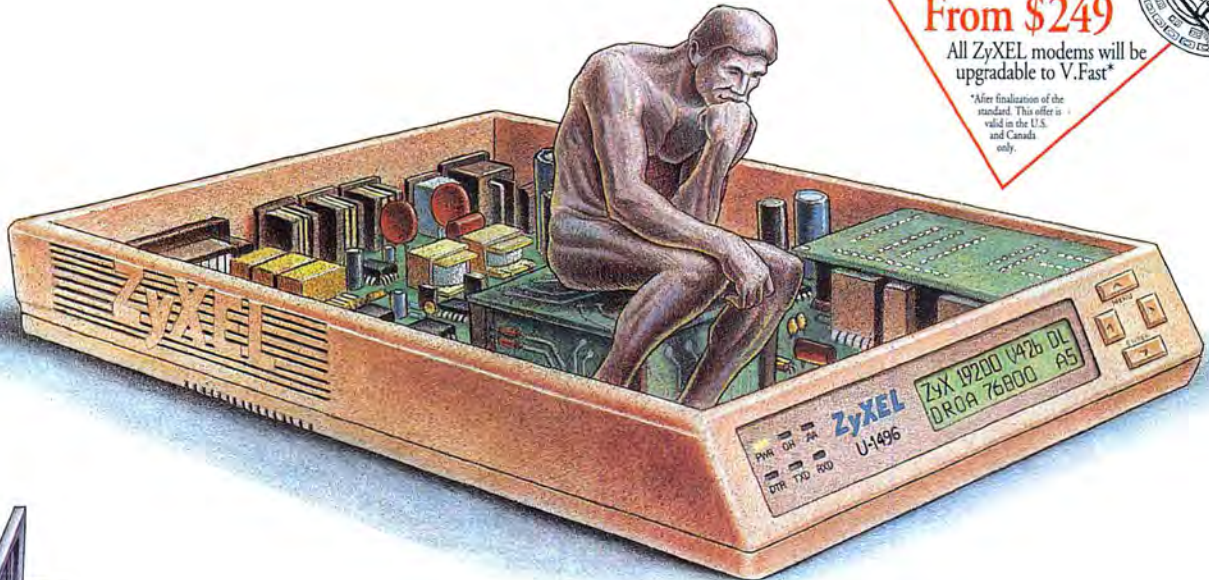
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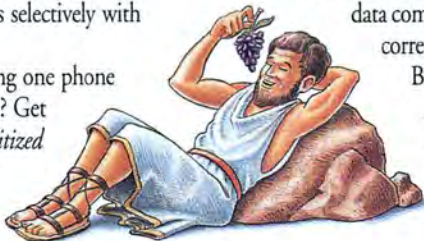
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600mb	3.5"	10.5ms	889	949*
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1.6gig	5.25"	15ms	1289	1348*
2.2gig	5.25"	12ms	1589	1689*
2.4gig	5.25"	11ms	2039	2139
2.5gig	3.5"	8ms	2229	2289
3.4gig	5.25"	10ms	2729	2829

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128mb	Fujitsu	30ms	855
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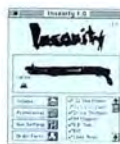
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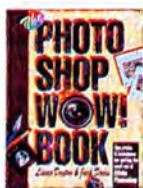
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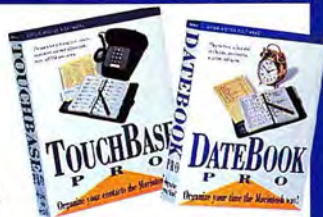


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Minimum requirements: LC, 2MB RAM (2.5MB RAM recommended), System 6.0.7, 5MB hard disk space.

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Minimum requirements: Mac Plus, 512K RAM, System 6.0.7.

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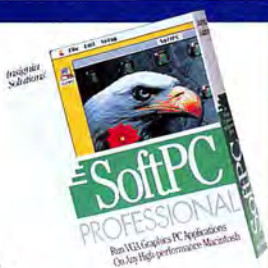


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Minimum requirements: Mac Plus, 1MB RAM, System 4.1.

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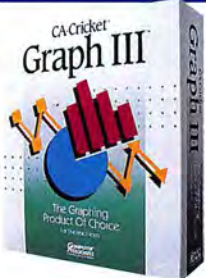


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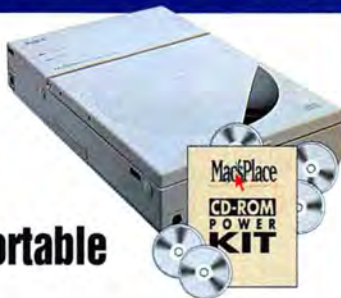


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Quicken 4.0 & Stacker Bundle

There are two basics every Mac user wants – more electronic storage space and a way to take advantage of their Mac to organize their finances. Get both with this month's bundle of Quicken 4.0 and Stacker for Macintosh. Quicken 4.0 is the latest version of the popular personal and small business finance program. Print and automatically address checks, update your check register, keep track of tax information, and print detailed reports. (Includes information on a \$10 rebate for owners of previous versions of Quicken.) And Stacker's patented LZS data compression technology stores your data more efficiently without changing the way your Mac works – you just have double the disk space available. It's 100 percent compatible with all your applications. (#6452/#6062, Intuit/Stac Electronics) ●

Minimum requirements: Mac Plus, 1 MB of RAM, and System 6.0.5.



\$298.

ACCURA 144+ Fax 144

Everything you need to send and receive data and Group 3 faxes is here. It's a V.32bis, 14,400 bps fax/data modem which also supports 9600, 2400, 1200, and 300 bps data, plus V.42/V.42bis and MNP 5 error-control and data compression. Get up to 57,000 bps throughput with V.42bis. Includes cables and fax software. (Hayes, 6068)

Minimum requirements: Mac Plus, 1MB RAM.



\$12.

Sony HD 3.5" 10-Pack

Get a free Sony audio or video tape when you buy a 10-Pack of Sony High-Density 3.5" Floppy Disks. That's right! Just send in the coupon included with your disks. Sony HD disks feature a full lifetime warranty and an exclusive magnetic particle formulation for unsurpassed performance. Offer expires June 30, 1994. Supply limited. (#6655, Sony) ●



\$166.

PG:PRO 1.5

Macworld says, "Staz Software has produced the equivalent of an object-oriented programming (OOP) environment that doesn't require previous OOP experience." PG:PRO adds a graphical development interface to FutureBASIC and other object-oriented extensions. It lets you draw your interface and then generate the source code and resources necessary to recreate it. (#5713, Staz Software)

Minimum requirements: Mac Plus, 1MB RAM, System 5.0.



\$148.

FutureBASIC

"FutureBASIC is a complete, easy-to-learn, real-world programming tool," says Macworld. It has high-level, object-like extensions to the BASIC language for creating windows, menus, buttons, and even scrolling text-edit fields with a single statement. It also sports an in-line assembler, unrestricted access to the Mac toolbox, and the ability to compile virtually any kind of Mac code resource. (#5647, Zedcor) ●

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.5, a hard drive.

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Match wits with Snoopy and the Peanuts Gang. Kids can join in five fun activities as they learn and practice math, geography, reading, coloring, and Flying Aces games. Real voice narration, zany sounds, and the appearance of Charles Schulz' much-loved characters make this a program popular with kids of all ages. Increasing levels of skill keep games challenging but not difficult. (#5911, Image Smith)

Minimum requirements: Mac SE/30, 4MB RAM, System 6.0.7.

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Polaroid CP-60 9" Filter

See the difference in glare reduction and contrast enhancement when you install a Polaroid CP filter on your monitor. Circular polarizing (it traps up to 99 percent of the reflective light) sets this one apart from other filters. A special coating reduces static and eliminates up to 98 percent VLF/ELF radiation. Made of optical quality triacetate. Buy now and get a pair of Polaroid sunglasses FREE (\$16.95 value). (#6660, Polaroid)

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This all-new edition of Wheel of Fortune features Vanna White, the most popular game show hostess ever, and includes over 2,000 all-new puzzles. New and enhanced graphics along with improved game play bring you the most exciting version of America's favorite game show. Or try to deduce the right questions to Alex Trebek's answers in Jeopardy. (#6508, Gametek)

Minimum requirements: Mac Plus, 2.5MB RAM, System 7.
\$24. Jeopardy with Alex Trebek #6513

\$48.



Square One & Bloopers Bundle

You get Bloopers FREE in this exclusive Mac's Place Bundle! Square One stores all of your favorite files in an easy-to-use icon palette. To access a file, just double click on its icon. Group several files into a single work-group icon and open them all at once. And Bloopers is full of fun sounds, gags, and practical jokes. Add oinks, moos, typewriter sounds, and more to any Mac. (#6625, Binary)

Minimum requirements: Mac Plus, 2MB RAM, System 7.

\$68.



7th Heaven & Ultimate Patterns Bundle

With 7th Heaven Utilities, System 7 becomes faster, more flexible, more informative, and easier to use. A collection of applications and installers (no INITs or CDEVs) lets you customize System 7 without the memory- and space-eating tendencies of the alternatives. FinderExpress uses the Finder to fast-file copy up to 120MB per minute. Informant lets you know your exact system configuration. Calendar, with stunning graphics, shows you one and three month views. And you get Chameleon Ultimate Patterns Vol. 1. It's the ultimate Mac desktop pattern utility. The finest collection of Mac desktop patterns, including Artbeats marble and tile patterns, are available in color, grayscale, and black and white. (#6649, Logical Solutions, Inc.)

Minimum requirements: Mac Plus, 2MB RAM, System 7, a hard drive. Color monitor recommended.

\$110.



Tempo II Plus 3.0

Automate your Mac with "intelligent" macros. Create hundreds of time-saving shortcuts, and simplify complex tasks. Tempo's "interactive" macros use conditional tests to determine how to format a document, when to back up your database, or which filters to apply in a "batch-process" task. Free phone dialer included! (#6534, Affinity Microsystems Ltd.)

Minimum requirements: Mac Plus, 1MB, System 6.0.2.

\$34.



Bridge 7.0

Bridge 7.0 is a complete bridge-playing program. You and your computer partner bid against two computer opponents and then play out the hand. Bidding is Standard American, five-card major and utilizes the Stayman and Blackwood conventions as well as weak or strong 2 bids. Many new features have been added to further refine this classic computer program. (#6545, Artworx)

Minimum requirements: Any Mac with 1MB RAM and an 800K drive.
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Mac's Place
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Minimum requirements: Mac Plus, System 6.0.1, two 800K drives or a hard drive.

\$39.



Pathways into Darkness

Continuous-motion, 3D, texture mapped graphics have arrived on the Mac! You'll explore an ancient pyramid on your mission to save the world from a hostile alien demon. Explore miles of catacombs through a smooth scrolling, first-person interface. Beautifully rendered graphics and active panning stereo sound combine to make Pathways Into Darkness the closest thing to virtual reality without a helmet. (#6639, Bungie)

Minimum requirements: Any 256 or 8-bit color Mac, 2MB RAM, System 6.0.5, 5MB hard disk space.

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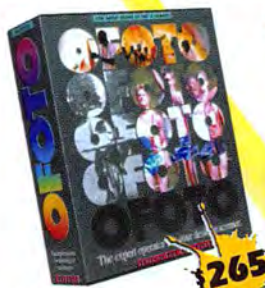
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UPDATE



FAXPRO II 14.4 V.2.2 HI-SPEED MULTIUSER

FaxPro II 14.4 is a complete hardware and software package which includes a 14,400 bps fax modem that works with all standard Group 3 fax machines. The new fax modem significantly increases transmission speed, saving time and money on phone bills. Also, FaxPro II 14.4 users can transmit to the more popular 9,600 bps fax machines. Item # CYP17

FaxPro II MultiUser Fax System 9600 \$648

V.2.2 Item # CYP12

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Item # CYP18 (compatible with most fax modems)

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TELECOUPLER II

The Road Warrior Telecoupler II connects your portable computer's modem to virtually any telephone—even cellular phones—delivering high speed FAX or data communication whenever and wherever you need it. It's fast—up to 14,100 bps and it eliminates the need for a "hard-wired" connection or the elusive RJ-11 modular phone jack. So whether you are at a hotel, pay telephone or at a customer site, the Telecoupler gives you the power to communicate the world over. International travel kits available. Item # CPP10

UPDATE



RAY DREAM DESIGNER 2.0

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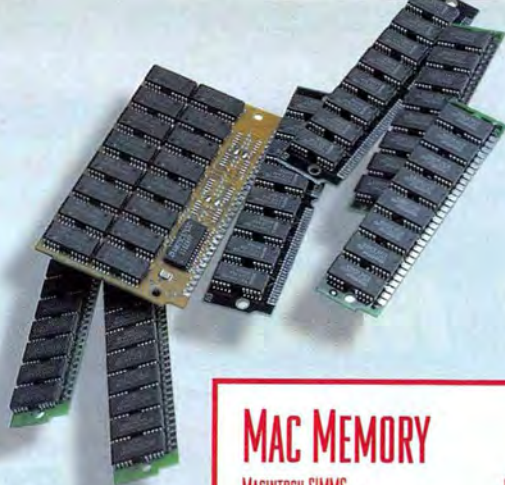
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12289 PB Travel Case/PB Numeric Keypad.....119
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11522 5.25" 512 MB Optical	139

Tape Media

1603 DG60m DDS Tape Cartridge	16
2520 DG90m DDS Tape Cartridge	16

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3297 3.5" 800k Disks (10)	9
6148 3.5" 800k Disks (30)	25
3298 3.5" FDHD Disks (10)	13
6375 3.5" FDHD Disks (30)	37
11876 3.5" DS/DD Disks (100)	60
11871 3.5" FDHD Disks (100)	95



3.5" FDHD Disks \$13

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2242 800k Disks (50)	32
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2243 800k Color Disks (10)	10
2239 FDHD Color Disks (10)	14
11792 FDHD formatted w/QuickCash (10)	14
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BASF \$14

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11865 3.5" DS/DD disks (30)	22
11864 3.5" DS/DD disks (50)	32
11870 3.5" FDHD disks (10)	12
11869 3.5" FDHD disks (30)	35
11867 3.5" FDHD disks free T-Shirt (50)	50

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10440 128 MB, 3.5" Optical (3)	109
10442 128 MB, 3.5" Optical (5)	175
10441 128 MB, 3.5" Optical (10)	339

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11247 SupraFax Modem Plus 24/96 V.42bis	142



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Zoom Telephonics 30 day MBG

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7757 FaxModem AFX - 24/96/S, 48/R	74
3576 FX9624V 24/96 S/R fax, V.42, V.42bis	119
4698 VXXV.32bis 14,400 - V.42, V.42bis	215
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11045 PM14400FXMT 14.4 fax V.32bis	229



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ACCURA 144 + FAX144

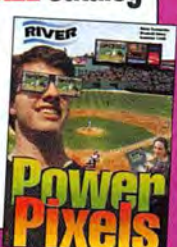
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Hayes 2-Year Warranty

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Conner							
85	CP-30080E	16	1300	24	\$199	\$259	
120	CP-30100	16	1300	24	\$259	\$309	
170	CP-30170E	16	1400	24	\$269	\$329	
213	CP-30200	15	2000	24	\$349	\$399	
Quantum							
85	ELS 85S	17	1800	24	\$179	\$249	
127	ELS 127S	17	1800	24	\$199	\$279	
170	ELS 170S	17	2000	24	\$219	\$299	
240	LPS 240S	16	2300	24	\$299	\$389	
Digital							
1.05GB	DSP-3105	9.5	2600	60	\$999	\$1,049	\$1,099
Seagate							
1.05GB	ST-11200N	10.5	3200	60	\$999	\$1,049	\$1,099
2.1 GB	Barracuda	8	4500	60	\$2349	-	\$2399
Fujitsu							
520MB	M2624FA	9	2700	60	\$799	\$859	\$899
1.06GB	M2694FA	9	2800	60	\$1,099	\$1,149	\$1,199
Toshiba							
1.2 GB	MK538	12.5	2600	60	\$999	\$1049	\$1099
210 (pwrbk)	MK-224	12	1800	12	\$499	-	-

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120mb	17ms	\$275	\$375
160mb	17ms	\$349	\$449

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525mb	10ms	\$699	\$759

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CMO-OMD5010 Epson	128mb	3.5" Half Height	45ms		\$969
CMO-JY750 Sharp	594/652mb	5.25" Half Height	40ms	\$1869	\$1899
CMO-5031E Ricoh	594/652mb	5.25" Full Height	28ms		\$2249
CMO-Tahiti II MaxOptix	650/1.0GIG	5.25" Full Height	35ms		\$2999
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AND
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240mb	7245S	3.5" Low Profile	15ms	235mb	\$279	\$339
345mb	7345S	3.5" Low Profile	12ms	327mb	\$399	\$459
540mb	MXT-540	3.5" Low Profile	8.5ms	521mb	\$899	\$959
1240mb	MXT-1240	3.5" Half Height	8.5ms	1150mb	\$1289	\$1349



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Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
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2.4GIG	ST12400N		9ms	2000mb	\$2129	\$2189
2.4GIG	ST12550N	Barracuda	8ms	2050mb	\$2399	\$2459
5.25" FULL HEIGHT						
1.6GIG	ST41651N	Wren-8	15ms	1350mb	\$1279	\$1379
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mac6fax

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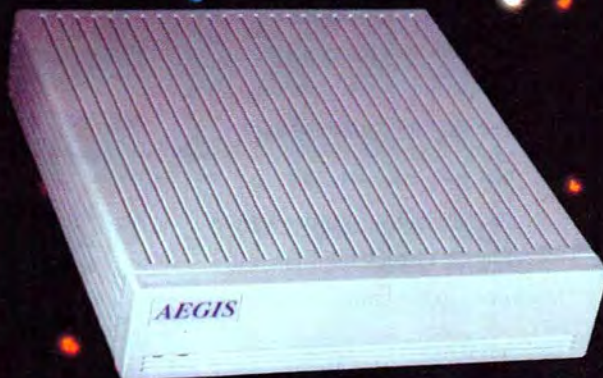
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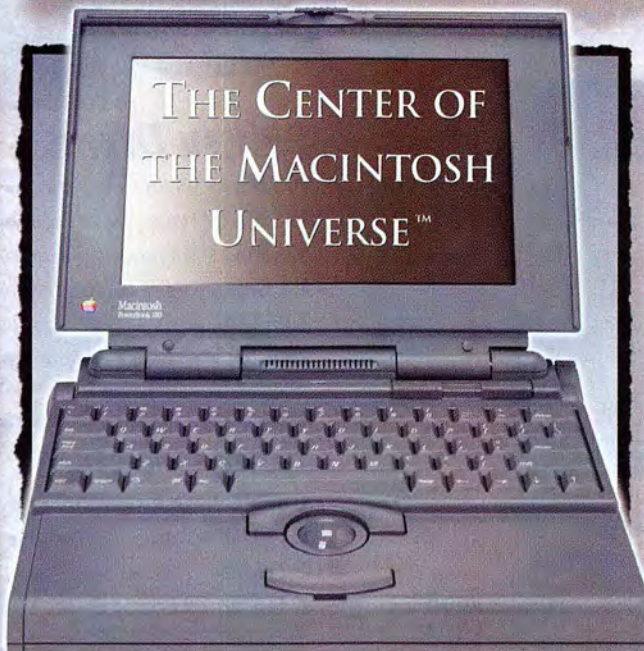
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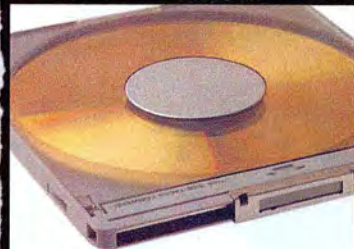
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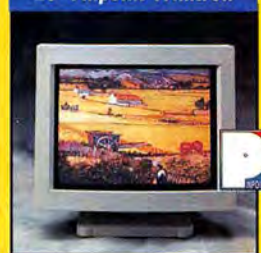
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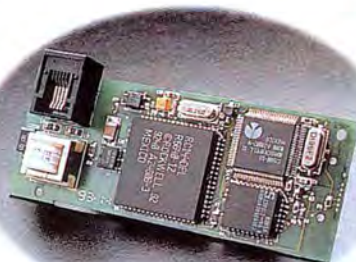
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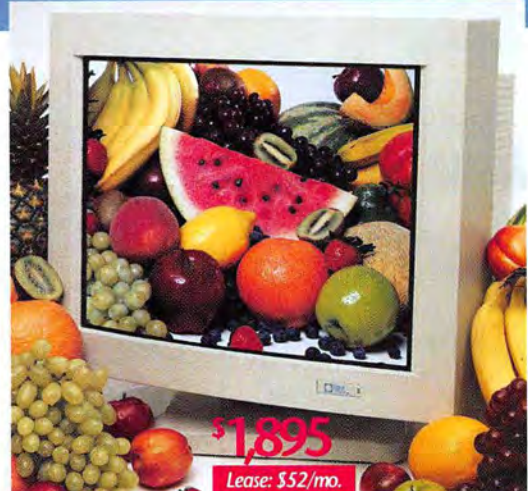
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Video Spigot* **369**
Video Spigot & Sound* **499**
Thunder 24 **2239**
Thunderlight **1729**

*24-bit; captures up to 30 frames/second



The photo above is a 300 dpi image of an 8 x 10 transparency. It was scanned on the RealTech Scan 800 with Transparency Option, then adjusted with ScanMatch and color-corrected with Adobe Photoshop.



MICROTEK
Scanmaker IIIXE



**Scan 800 with
Transparency Option**

\$1,595
Lease: \$44/mo.



Scanners

Flatbed desktop scanners for 24-bit color, 8-bit grayscale, and black/white images. Ideal for mid-range output or position prints for mockups/presentations.

	Price	Dpi	Brightness & contrast levels	Scanning area	Flat art	Transparencies	Slides	Software
MICROTEK								
Scanmaker II	\$929	600	14	8.5 x 13.5	■			Includes limited version of Adobe Photoshop
Scanmaker IIIXE	1,199	600	14	8.5 x 13.5	■			Includes full version of Adobe Photoshop
REALTECH								
Scan 800	\$1,099	800	200	8.5 x 11.75	■			Includes Scan-Match color calibration software
Optional Adobe Photoshop	200							
Scan 800 with Transparency Option	1,595	800	200	8.5 x 11.75	■	■	■	
UMAX								
UC 630	\$1,119	600	51	8.5 x 14	■			Includes full version of Adobe Photoshop
Transparency Option	679	(600)	(51)	6 x 9	■	■	■	
UC 840	1,299	800	51	8.5 x 14	■			Includes full version of Adobe Photoshop
Transparency Option	679	(800)	(51)	6 x 9	■	■	■	

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Printers.

QMS 860
Hammerhead



QMS



TI MicroLaser Turbo



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INSTRUMENTS

TI MicroLaser Plus

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The right printer can do wonders for your productivity. Do you need speed? Adobe PostScript Level 2? Do you need to print a lot of pages each month?

Dpi
Engine speed
RAM

Interpreter
Microprocessor

Duty cycle
Paper trays

SCSI port
Interfaces

Resident fonts
Misc.

LETTER-SIZE PRINTERS

DEClaser 1152

\$995 digital

Lease: \$28/month

- 300 dpi
- 4 pages/min.
- 2 Mb RAM (expandable to 4 MB)

- Adobe PostScript Level 2
- Motorola 68000 processor

- 6,000 pages per month
- Adjustable 70 sheet paper tray (optional 250 sheet paper tray)

- No SCSI port
- Appletalk RS-422, parallel, and RS-232C.

- 17 (upgradable to 43 with a cartridge)

Texas Instruments MicroLaser Plus

\$1,139

Lease: \$32/month

- 300 dpi
- 9 pages/min.
- 1.5 Mb RAM (expandable to 4.5 MB)

- Adobe PostScript Level 1
- Motorola 68000 processor

- 10,000 pages per month
- Optional 2nd paper drawer and envelope feeder

- Optional SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 17 Available with 35 resident fonts (\$1239)

NewGen PS 880p

\$2,119

Lease: \$58/month

- 800 dpi
- 4 pages/min.
- 12 Mb RAM (expandable to 32 MB)

- PostScript
- Weitek RISC processor

- 8,000 pages per month
- Built-in 70 sheet paper tray

- Optional SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 35
- Supports Adobe PostScript NewGen's proprietary Image Enhancement Technology

Texas Instruments MicroLaser Turbo

\$1,499

Lease: \$41/month

- 300 dpi
- 9 pages/min.
- 2.5 MB RAM (expandable to 6 MB)

- Adobe PostScript Level 2
- Weitek RISC processor

- 10,000 pages per month
- Optional 2nd paper drawer

- Optional SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 35

TABLOID PRINTERS

Compaq Page Marq 15

\$2,795

Lease: \$77/month

- 400 dpi
- 15 pages/min.
- 4 Mb RAM (expandable to 18 MB)

- Adobe PostScript Level 2
- 2900 RISC processor

- 50,000 pages per month
- 1 fixed letter tray, 1 letter size twin tray
- Optional 11 x 17 paper tray (\$85)

- Optional Hard Drive
- Optional Ethernet
- Parallel, RS-232C, Appletalk ports

- 43 outline scalable fonts, 7 fixed fonts

Compaq Page Marq 20

\$3,995

Lease: \$111/month

- 400 dpi
- 20 ppm (letter size)
- 4 MB RAM (expandable to 20 MB)

- Adobe PostScript Level 2
- 2900 RISC processor

- 50,000 pages per month
- 3 letter size twin trays
- Optional 11 x 17 paper tray (\$85)

- Optional Ethernet
- Parallel, RS-232C, Appletalk ports

- 43 outline scalable fonts, 7 fixed fonts

QMS 860 Hammerhead

\$4,279

Lease: \$118/month

- 600 dpi
- 8 ppm (letter size); 4.6 ppm (tabloid size)
- 12 MB RAM (expandable to 32 MB)

- Adobe PostScript compatible
- Intel 80960CA RISC processor

- 10,000 pages per month
- Optional 2nd paper cassette

- SCSI port
- Optional Ethernet
- Appletalk RS-422, parallel, and RS-232C

- 39

More printers!

If you want a printer that's not listed in this ad, please call us toll-free.

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Kodak Diconix 701 Inkjet....\$299

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TABLOID SIZE

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RealTech

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RealTech Color 350\$595
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33 MHz Accelerator	\$379
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50 MHz Accelerator	719
PowerCache Adapter	40

Photoshop Accelerator

Includes PicturePress 2.5, Charger Plug-ins, and Kodak Photo CD access with clip art images.

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Dayna EtherPrint Plus	439
Dayna EtherPrint 3	379

MODEMS

Global Village PowerPort

-Gold	\$399
-Silver	339
-Bronze	189



Supra v.32 bis (14,400)	\$299
SupraFax Modem Plus	159
SupraFax 14.4 PB	299
SupraFax 14.4 PB w/voice	399

SupraFax Modems include STF and Microphone software, and are backed by a 5-year warranty.



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DaynaPORT E/II-T NuBus Card ..	\$149
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DaynaPort E/Z. Ideal for Macs that don't have a slot for a network interface card.

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Quadra 800/Trinitron Intermediate Graphics Solution.

Quadra 800 with 8 MB of RAM, 230 MB hard drive, RealTech 20" Trinitron monitor with RasterOps PaintBoard Li, and KeyTronic MacPro Plus extended keyboard.

LC III, 4 MB of RAM, 80 MB hard drive, RealTech 15" Full Page Display, and Apple LC keyboard

Centris 610, 4 MB of RAM, 80 MB hard drive, 1 MB VRAM, SuperMac 17" Trinitron monitor, and KeyTronic MacPro Plus extended keyboard

Centris 650, 8 MB of RAM, 230 MB hard drive, RealTech 20" color monitor, RasterOps Paintboard Li, w/built-in Ethernet and FPU, and KeyTronic MacPro Plus extended keyboard

Quadra 950, 8 MB of RAM, 560 MB Micropolis hard drive, RealTech 20" Trinitron, and KeyTronic MacPro Plus extended keyboard



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PowerBook Duo 230, 8 MB of RAM, 80 MB hard drive, 33 MHz 68030 microprocessor

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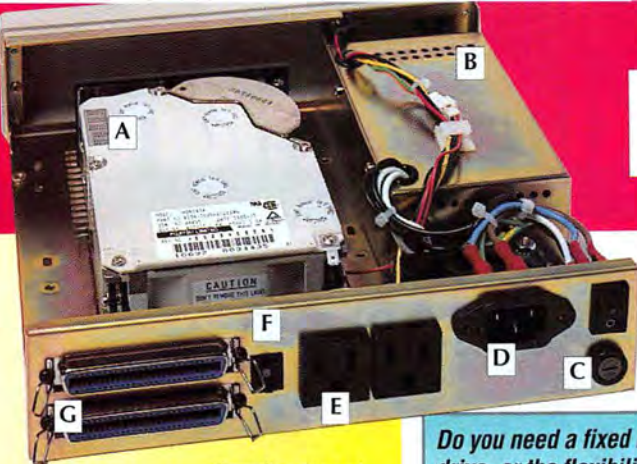
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- Fast access times
- top-level warranties on all mechanisms
- 2-year warranty on enclosure
- premium double-shielded cable

- A. We offer the highest quality name-brand mechanisms available; fully tested and burned in
- B. Shielded 40 watt power supply (65 watt for FH drives) provides an additional margin of safety from electrical interference, keeping your data free of corruption
- C. External fuse keeps fuse replacement simple
- D. Power cable plug-in
- E. Two switched outlets provide power to additional peripherals, allowing 1-step system power-up
- F. Easy-to-use pushbutton SCSI I.D. selector switch
- G. Two 50-pin SCSI connectors for simple configuration

(Not shown) Premium double-shielded 26-inch Mac-to-SCSI cable prevents electronic interference

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Allows all NuBus Macs to communicate with newer, high-performance hard drives at substantially faster transfer rates.

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Do you need a fixed hard drive, or the flexibility of an optical? Call us; we can explain your options.

	Model number	Internal price	External price	Formatted Mac capacity (in MB)	Average access time (in ms)	Transfer rate* (in MB/second)	Form factor**	Warranty (years)
85 - 120 MB								
Conner 85	CP-30080E	\$209	\$279	82	17	1.5	LP	1
Quantum 85	ELS85	199	269	82	17	1.4	LP	2
120 - 250 MB								
Quantum 127	ELS127	\$229	\$299	124	17	1.4	LP	2
Conner 170	CP-30170E	259	329	160	9	1.5	LP	1
Quantum 170	ELS170	259	329	160	17	1.4	LP	2
Conner 212	CP-30200	359	429	206	12	2.5 ¹	LP	1
Quantum 240	LPS240	339	409	234	10	1.4	LP	2
Maxtor 245	7245	299	369	245.6	15	3.0 ¹	LP	2
320 - 570 MB								
Maxtor 345	LXT-340	\$409	\$479	324	15	2.1 ¹	LP	2
Fujitsu 520	M2624FA	799	869	496	9	2.7 ¹	HH	5
Quantum 525	LPS525	899	969	525	10	2.9 ¹	LP	2
Maxtor 540	MXT-540	919	989	546	9	5.5 ²	HH	2
Conner 540	CP-3540	899	969	515	12	5.5 ²	HH	1
Micropolis 560	M2105	1049	1119	532	10	5.0 ²	HH	5
700 MB - 1.3 GB								
Quantum 700	PRO700	\$1199	\$1269	670	10	2.9 ¹	HH	2
Micropolis 800	M2108	1199	1269	698	10	5.0 ²	HH	5
Toshiba 877	MK-438FB	999	1069	830	12.5	3.0 ¹	HH	2
Quantum 1050	PRO1050	1239	1309	1000	10	2.9 ¹	HH	2
HP 1050	97558	1649	1749	987	13.5	2.8 ¹	FH	5
Fujitsu 1.2	M2266	1249	1349	1079	14.5	3.0 ¹	FH	5
HP 1.2	C2247	1589	1659	1000	10.5	5.3 ¹	HH	5
Micropolis 1.2	M2112	1249	1319	1005	10	5.0 ²	HH	5
Quantum 1.2	PRO1225	1419	1489	1200	10	2.9 ¹	HH	2
Toshiba 1.2	MK-538FB	1199	1269	1200	12.5	4.0 ¹	HH	3
Maxtor 1.2	MXT-1240	1399	1469	1240	9	4.0 ²	HH	3
Conner 1.3	CP-31370	2059	2129	1030	10.5	6.0 ¹	HH	1
2.0 - 3.6 GB								
Micropolis 1.7	M2217	\$2049	\$2119	1750	10	5.6	HH	5
Fujitsu 2.0	M2652	2199	2299	1752	11	4.8 ²	FH	5
Seagate 2.1	ST42100N	1699	1799	1900	12.9	3.9 ²	FH	5
Fujitsu 2.4	M2654	2399	2499	2000	11	4.8 ²	FH	5
Micropolis 2.4	M1924	2599	2699	2100	10	4.8 ²	FH	5
Seagate 2.4	ST42400N	2549	2649	2050	10	4.5 ²	FH	5
HP 2.4	C3010	2899	2999	2000	11.5	5.3 ²	FH	5
Seagate 3.4	ST43400N	3399	3499	2750	11	6.0 ²	FH	5
Micropolis 3.6	M1936	3299	3399	3022	10	6.0 ²	FH	5

* Transfer rate (or throughput) depends on your Mac CPU and system configuration. For more information, ask your Hardware That Fits sales partner. ** Form Factor Low Profile (LP)=3.5 Half Height (HH)=3.5 Full Height (FH)=5.25

¹ SCSI-2 ² SCSI-2 Fast These drives are most efficient when used with a Macintosh Quadra 800, 950 or a RealTech SCSI-2 card.

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access time; 1 yr. warranty).....\$3269

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90-meter tape. Depending on your data,
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44 MB Drive.....\$389
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Software is included with your drive.
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DT-2108	700 Megs	3.9 ms	3.50	◀▶
DT-2112	1050 Megs	3.9 ms	3.50	◀▶
DT-1528	1340 Megs	4.1 ms	5.25 FH	
DT-1908	1400 Megs	3.9 ms	5.25 FH	◀▶
DT-1548	1750 Megs	3.9 ms	5.25 FH	▶
DT-1924	2000 Megs	3.9 ms	5.25 FH	◀▶
DT-1936	3000 Megs	3.9 ms	5.25 FH	◀▶

◀ Fast SCSI-2 ▶ 5,400 RPM

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15 ms Short Seek Time

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► DGR 128REM

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625 Kb/s Transfer Rate
< 40 ms Average Seek Time
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► DGR 256REM

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MacUser Labs, April 1993

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170MB.....		\$299
240MB (Over 1 Million Sold!).....		\$369

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QUANTUM INTERNAL		
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1.2 GIG.....		\$1,199
QUANTUM EXTERNAL		
525 MB.....		\$799
1 GIG.....		\$1,129
1.2 GIG.....		\$1,249

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88 MB With Cartridge	\$479
88c MB With 88 MB Cartridge*	\$549
* The 88c drive will read and write 44MB cartridges, but will not format 44MB cartridges.	
CIRCLE 152 ON READER SERVICE CARD.	

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4 mb 70 ns ..	\$155
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1. For how many micro computers do you buy products?
(check one)

☐ 01) 1-4 ☐ 02) 5-49 ☐ 03) 50+

2. Your primary job function is: (check one)

☐ 01) Administrative/General Management ☐ 03) Engineering/R&D
☐ 02) MIS/DP, Communications Systems, Programming ☐ 04) Finance/Accounting
☐ 05) Marketing/Sales ☐ 06) Computer Dealer/VAR

3. For which of the following products are you involved in selecting brands/models to be bought by your company or organization? (check all that apply)

4. Which of the following products have you bought in the last 6 months? (check all that apply)

SOFTWARE:
Accounting
Spreadsheets/Financial Planners
Project Managers/Planners
Word Processors
Database Managers
Graphics/Presentation Software
Integrated Software
Communications
Utilities

Q3 Q4
☐ 01 ☐ 01
☐ 02 ☐ 02
☐ 03 ☐ 03
☐ 04 ☐ 04
☐ 05 ☐ 05
☐ 06 ☐ 06
☐ 07 ☐ 07
☐ 08 ☐ 08
☐ 09 ☐ 09

HARDWARE:
Modems
Scanners
Microcomputers
Printers/Plotters
Monitors/Displays
Storage
Add-in Boards
Networking

Q3 Q4
☐ 10 ☐ 10
☐ 11 ☐ 11
☐ 12 ☐ 12
☐ 13 ☐ 13
☐ 14 ☐ 14
☐ 15 ☐ 15
☐ 16 ☐ 16
☐ 17 ☐ 17

5. If so, what function do you serve in the buying process? (check all that apply)

☐ 01) Initiation/Determine Need
☐ 02) Selection of Brand and Model
☐ 03) Selection of Source
☐ 04) Authorization
☐ 05) Other

6. Over the next 12 months, how much will your organization spend on computer products or services? (check one)

☐ 01) over \$5 million ☐ 05) \$50,000 - \$99,999
☐ 02) \$1 - 5 million ☐ 06) \$10,000 - \$49,999
☐ 03) \$500,000 - \$999,999 ☐ 07) under \$10,000
☐ 04) \$100,000 - \$499,999

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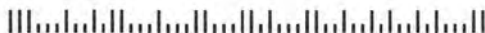
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SOFTWARE:

Accounting ☐ 01 ☐ 01
Spreadsheets/Financial Planners ☐ 02 ☐ 02
Project Managers/Planners ☐ 03 ☐ 03
Word Processors ☐ 04 ☐ 04
Database Managers ☐ 05 ☐ 05
Graphics/Presentation Software ☐ 06 ☐ 06
Integrated Software ☐ 07 ☐ 07
Communications ☐ 08 ☐ 08
Utilities ☐ 09 ☐ 09

HARDWARE:

Modems ☐ 10 ☐ 10
Scanners ☐ 11 ☐ 11
Microcomputers ☐ 12 ☐ 12
Printers/Plotters ☐ 13 ☐ 13
Monitors/Displays ☐ 14 ☐ 14
Storage ☐ 15 ☐ 15
Add-in Boards ☐ 16 ☐ 16
Networking ☐ 17 ☐ 17

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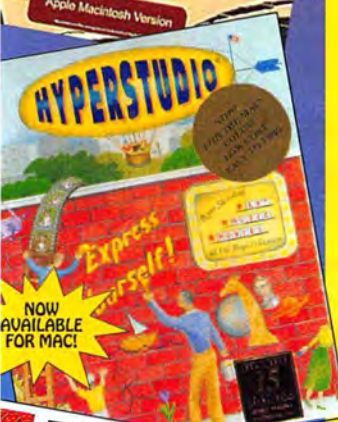
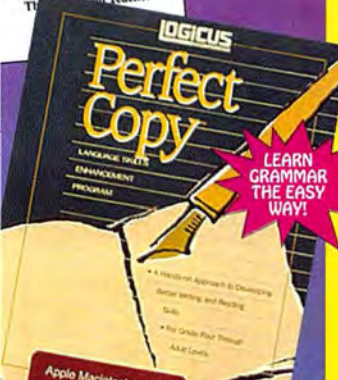
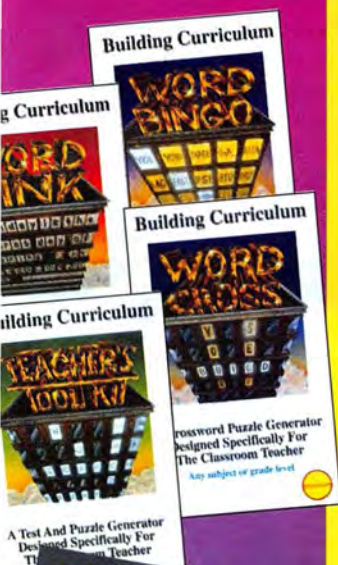
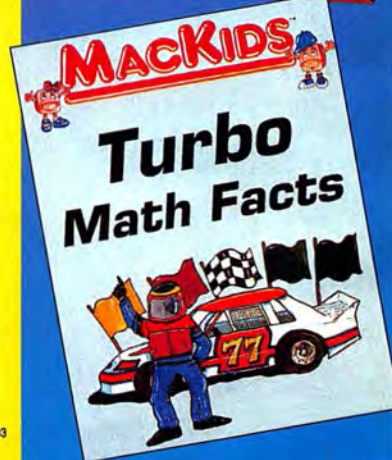
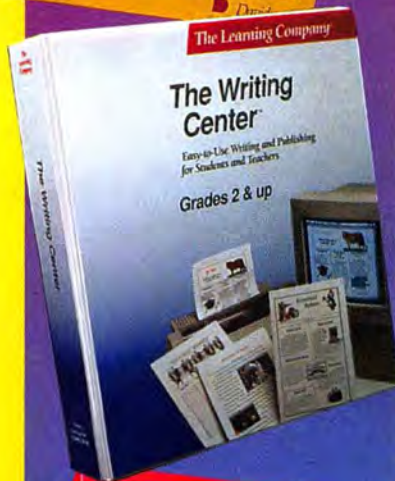
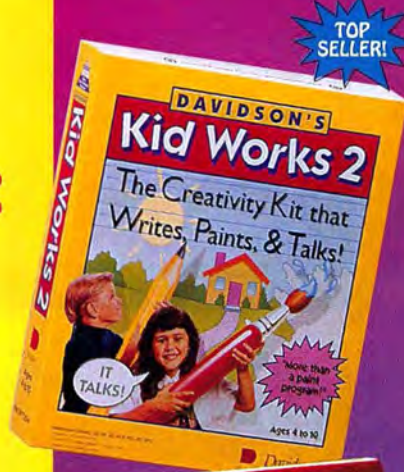
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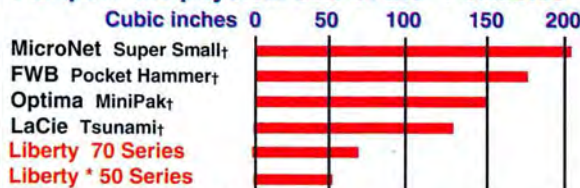


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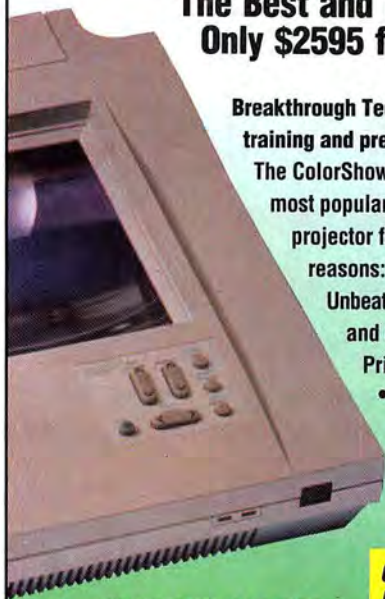
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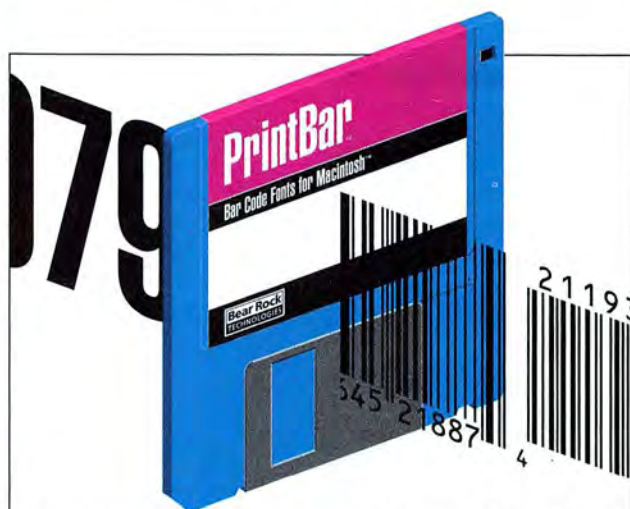
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1750	M2652S	FH	11	\$ 1837	\$ 1967
2061	M2654S	FH	11	\$ 2017	\$ 2147

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MB	TYPE	SIZE	SEEK	INT	EXT
240	LPS240S	1"	16	\$ 311	\$ 406
525	LPS525S	1"	10	\$ 689	\$ 784
1060	PD1050S	3.5	10	\$ 1032	\$ 1127
1200	PD1225S	3.5	10	\$ 1147	\$ 1242

MAXTOR 2YR WARRANTY

MB	TYPE	SIZE	SEEK	INT	EXT
213	7213SY	1	15	\$ 259	\$ 354
340	7345S	3.5	13	\$ 399	\$ 494
540	540SY	3.5	8.5	\$ 887	\$ 982
1240	1240S	3.5	8.5	\$ 1135	\$ 1230
1059	PO-12S	FH	13	\$ 1034	\$ 1164
1345	P1-17S	FH	13	\$ 1243	\$ 1373

CONNER 1YR WARRANTY

MB	TYPE	SIZE	SEEK	INT	EXT
170	CP30170	1"	17	\$ 209	\$ 304
212	CP30200	1"	12	\$ 284	\$ 379
545	CP30540	1"	10	\$ 703	\$ 798

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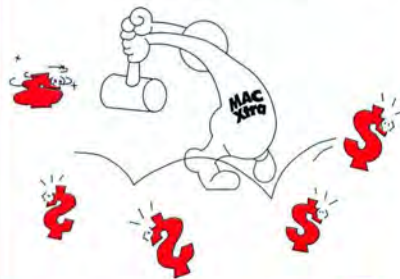
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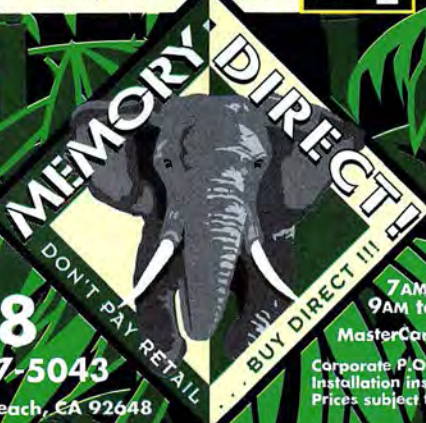
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10Base T Hubs

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AP1002 AsantePoint, Thick/Thin	\$329
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Mac II Family & Performa 600

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120MB GO	\$290 / 395	NEC CDR-74	Call
		NEC CDR-38	Call
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100	140/170	160/180	165C	210/230
2MB \$78	\$78	---	---	---
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ImagePro and Quik30

The ImagePro is a 68030 based accelerator and video combo board including math coprocessor. It can be used with your 15" or 19" monitor or ours! The Quik30 is identical to the ImagePro less the video options.

	For Mac SE	15" ImagePro System	19" ImagePro System
ImagePro			
25 MHz	505.00	795.00	935.00
33 MHz	635.00	925.00	1,065.00
50 MHz	695.00	985.00	1,125.00
Quik30			
25 MHz	355.00	N/A	N/A
33 MHz	485.00	N/A	N/A

*ImagePros and systems, add \$90.00 to above prices for Mac Plus/Classic
*Quik30s, add \$40.00 to above prices for Plus, \$95.00 for Classic

68882 FPU Boards

20 MHz for Macintosh LC	65.00
20 MHz w/2 slots for Mac IIsi	119.00
20 MHz for Mac Classic II	65.00

Cache Cards, Etc.

128K Cache Card for LCIII and Performa 430 w/25 MHz FPU	159.00
IIsi 64K Cache Card	135.00
IIci 64K Cache Card	125.00
IIsi 2-slot Card and 68882	119.00

Math Coprocessors

68882 16 MHz FPU	55.00
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Miscellaneous

T.I. MicroLaser 1 MB	49.00
Virtual 3.0	99.00
Mac Classic 1 MB Board	59.00
68851 16MHz PMMU	99.00
if requested, MODE 32 software included free w/PMMU	
Mac Portable 3 MB Card	425.00
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Due to volatility in the market all prices and availability are subject to change without notice.

Memory for the new Macs!

	CENTRIS/LC III	QUADRA 800
4 Megabyte	129.00	139.00
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32 Megabyte	CALL	CALL

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1 Megabyte	CALL FOR CURRENT PRICING ON ALL SPEEDS
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16 Megabyte	

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256K Quadra 700/900 VRAM	27.00
256K Quadra 950/0800 VRAM	31.00
256K Centris/LC III VRAM	31.00
512K Mac LC VRAM	49.00
512K Mac IIsx VRAM	59.00

PowerBook Memory

	100	140/170	160/180	165c	210/230
2 MB	79.00	79.00	---	---	---
4 MB	189.00	179.00	199.00	205.00	209.00
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8 MB	---	---	359.00	385.00	359.00
10 MB	---	---	439.00	CALL	---

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DiiMOCache 50 MHz Accelerator

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Awarded 4 1/2 Mice from MacUser's April 1993 Accelerator Review, the DiiMOCache Accelerator outperforms not only DayStar's PowerCache 50MHz but also most 68040 25MHz accelerators and costs less!

	w/o FPU	w/FPU
DiiMOCache 50 MHz Accelerator	675.00	749.00

Adapters available for IIsi, SE/30, II, IIsx, and IIsx. Call for prices.

68040 PROCESSOR WITH FPU FOR CENTRIS 610 AND 650 \$375.00

DayStar

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PowerCache 33MHz	380.00	459.00
PowerCache 50MHz	719.00	835.00
Turbo '040 25MHz	849.00	1089.00
Turbo '040 33MHz	1129.00	1339.00
Turbo '040 25MHz	N/A	2045.00
"Charger" for Photoshop FastCache 128K Quadra	799.00	CALL

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520MB	M2624FA	3.5 HH	9	\$739	\$799
1.1GB	M2694SA	3.5 HH	8.5	\$1545	\$1605
1.2GB	M2266SA	5.25 FH	14.5	\$1199	\$1259
2.0GB	M2652SA	5.25 FH	14.5	\$2099	\$2199
2.4GB	M2654SA	5.25 FH	14.5	\$2239	\$2339

• Five year warranty

QUANTUM

42MB	ELS42	3.5 1"	19	\$169	\$229
85MB	ELS85	3.5 1"	17	\$185	\$245
127MB	ELS127	3.5 1"	17	\$209	\$269
170MB	ELS170	3.5 1"	17	\$229	\$289
240MB	LPS240	3.5 1"	10	\$309	\$369
525MB	LPS525	3.5 1"	10	\$705	\$765
700MB	PRO700	3.5 HH	10	\$910	\$970
1.0GB	PRO1050	3.5 HH	10	\$1070	\$1130
1.2GB	PRO1225	3.5 HH	10	\$1160	\$1220
80MB	GRS	2.5 19MM	17	\$255**	\$355
120MB	Go+Drive	2.5 19MM	17	\$280**	\$380
160MB	GRS	2.5 19MM	17	\$360**	\$460

• ELS, LPS, PRO drives have two year warranty
• 2.5" drives have one year warranty

SYQUEST

		Single	Dual
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88MB	IMS 88C External	\$559	\$1045
105MB	IMS 105MB External	\$699	
44MB	44MB Cartridge	\$64	
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105MB	105MB Cartridge	\$79	

• Drives ship with one cartridge
• Drives have two year warranty

MAXTOR

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207MB	7213	3.5 1"	15	\$279	\$339
330MB	LXT-340	3.5 HH	15	\$569	\$629
540MB	MXT-540SL	3.5 HH	8.5	\$899	\$959
1.2GB	MXT-1240S	3.5 HH	8.5	\$1239	\$1299
1.2GB	PO-12S	5.25 FH	13	\$1099	\$1199
1.7GB	P1-17S	5.25 FH	13	\$1399	\$1499

• 3.5" drives one year warranty
• 5.25" drives two year warranty

SEAGATE

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1.6GB	ST41600N	5.25 FH	11.5	\$1799	\$1899
2.4GB	ST42400N	5.25 FH	11	\$2329	\$2429
3.4GB	ST43400N	5.25 FH	11	\$2949	\$3049

• One year warranty

MICROPOLIS

660MB	1624	5.25 HH	14.5	\$1235	\$1295
1.0GB	2112	3.5 HH	10	\$1335	\$1395
2.0GB	1924	5.25 FH	10	\$2695	\$2795

• Five year warranty

TOSHIBA

213MB	MK224FB-S	2.5 19MM	12	\$559**	\$659
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• One year warranty

** Internal configuration for PowerBook computers only

SIGMA DESIGNS

▼ ColorMax 15
for PowerBook 160, 180 and
Duo computers



\$619



▲ Power Portrait
for Mac Plus, Classic, Classic II,
SE, SE/30 & PowerBook computers

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		w/FPU	
for Mac LC, LCII, Performa 400, & Color Classic	40MHz	\$369	\$505
for Mac SE			
TransWarp 1325	25MHz	\$199	
TransWarp 1340	40MHz	\$259	\$389
for Mac Classic			
TransWarp 2325	25MHz	\$199	
TransWarp 2340	40MHz	\$259	\$389

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"Super performance for ALL software applications. Accelerates everything your computer does. From Quickdraw screen refreshes to spell-checking your documents, the PowerCache turbocharges your computer transparently."

Classic, Color Classic, SE, SE/30, LC, LC II, LC III, II, IIX, IICX, IICI, IISI, IIVI, IIVX, Performa 400 and 600 -

adapter required for all but the IICI, IIVI, IIVX and Performa 600.

PowerCache

33MHz \$375 \$459 w/FPU

40MHz \$545 \$635

50MHz \$715 \$845

PowerCache Adapter \$41

Charger - "Incredibly fast

NuBus accelerator for Adobe

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25MHz Turbo 040 \$1099

33MHz Turbo 040 \$1349

40MHz Turbo 040 \$2019

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20MHz Turbo 040i \$675

25MHz Turbo 040i \$849

33MHz Turbo 040i \$1099

• Ships with FastCache Turbo option.

FastCache

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Quadra 700/900 \$335

Quadra 800/950 \$375

IISI (64k) \$279

IISI (64k)/wFPU \$349

IICI (64k) \$199

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MegaHaus external enclosures feature external ID select, external termination, 2 SCSI connectors, Metal case. SpotOn software features disk caching, password protection, and a wide variety of drive icons.



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85Meg	17ms	3600	Quantum	2 Years	\$175	\$245
127Meg	17ms	3600	Quantum	2 Years	\$199	\$265
130Meg	17ms	3600	Maxtor	2 Years	\$195	\$259
170Meg	17ms	3600	Quantum	2 Years	\$215	\$279
170Meg	17ms	3600	Conner	1 Year	\$215	\$279
213Meg	15ms	3600	Maxtor	2 Years	\$269	\$339
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213Meg	12ms	4000	Toshiba	1 Year	\$549 (2 1/2" for Powerbook)	
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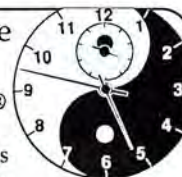
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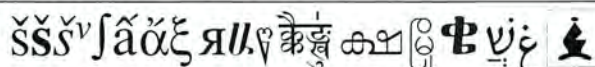
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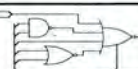
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Source: MacUser 1992 Study of Microcomputer Product Ownership and Buying Plans

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- 73% are involved in brand selection
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Source: MacUser 1992 Study of Microcomputer Product Ownership and Buying Plans

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Source: MacUser Mail Order Report, 1991, (past 12 months); ABC June 1992

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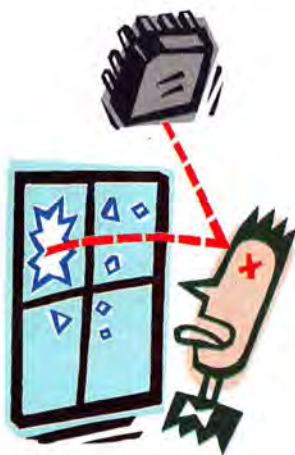
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Breaking Windows



Motorola's not-so-secret weapon may turn the tide in Apple's war with Microsoft and Intel.



Even as Apple marched toward an obvious dead end with the Motorola 68000 family, it had to choose a new direction. That direction was obvious: Just look at what Sun Microsystems has done, and do the same thing cheaper.

Historically, the desktop-computing revolution has largely followed in the footsteps of the more-expensive-workstation revolution. Whatever hardware innovations the minicomputer/workstation people have come up with have been copied by the desktop-computer makers. Built-in networking and big color screens are but two examples.


The most recent move was to adopt the RISC microprocessor architecture. Sun Microsystems uses the SPARC chip, Silicon Graphics uses the MIPS chip, and Digital Equipment is moving to the Alpha chip. Any of these three workstation companies would probably be thrilled if the mass-market computer makers wanted to adopt their respective chips, but that won't happen. The workstation chips are all designed with specific companies and their mostly proprietary software in mind. Sun does the best job of pretending to have an open standard, but nobody has ever really believed its pitch.

For a chip to be popular in the mass market, it has to come from a chip specialist — not from a computer company. Enter the PowerPC. Although the PowerPC chip is being designed jointly by IBM, Motorola, and Apple as part of some "deal" and technology exchange, when production ramps up, the final product will be a Motorola chip. More important, the first iteration — the PowerPC 601 chip — will be half the size of and just as powerful as the famous Pentium chip from Intel (more powerful, in some ways). Half the size means half the price. Unless someone drops the marketing ball, this chip should cripple Intel — and the Pentium especially — if the PC side of the business adopts it. Apple already has.

The interesting thing about all this is that not since the Apple II squared off against the old 8080 machines of the mid-1970s has there been a better chance that the two sides of the market would use the same microprocessor. The dominance of Microsoft and Intel nowadays already has the market edgy about its future. What software developer wants to compete with Microsoft's marketing muscle? Microsoft intends to dominate the business and makes no pretense about it. Microsoft

finances its efforts toward this goal with cash-cow licenses for Intel-based operating-system software. With the business controlled by Intel and Microsoft, there's not much room for the little guys. Although I've never believed that the little guys were dead, they're at an extreme disadvantage nowadays unless they take a job at Microsoft, grab some stock options, and hope that the Microsoft equities rise forever.

For this combination of Microsoft and Intel to continue its never-ending growth, however, Microsoft must eventually focus on Apple as an enemy. From the Microsoft perspective, Apple is a good source of revenues from sales of Excel and Word, but it would be better to have a customer buying Excel and Word *and* Windows in a market totally dominated by Microsoft. Also, Apple doesn't help Microsoft's buddy Intel with all this Motorola nonsense. Let's face reality: Apple is listed on a secret Microsoft strategic-planning document as a target for destruction. Apple knows this, and so does everyone else. If you haven't noticed, the psychological warfare has already begun. Open one of those Windows magazines, and you'll see a bunch of one-time Mac boosters pushing Windows. Even our old editor-in-chief Steve Bobker is doing it! The myth that Windows instantly turns the PC into a Mac is now widely believed. Even developers who have built their reputations on Mac software have been convinced that they should code for Windows first. It's pathetic.

IBM saw what was happening and knew that it wasn't in its best interest to let the market be dominated by sole-source Intel and rude Microsoft. IBM invented RISC and still knows it best. Why not find a chip company to help and invite Apple to join in to do something about the situation? Hence the PowerPC. Finally, a RISC chip that delivers on its promises. It will be the chip of the second half of this decade and the chip that will reestablish Apple as the spiritual leader of the computer revolution. If the rest of the industry adopts the chip, suddenly the field will be level again and innovation will reign. With everyone using the same chip, porting software across platforms will be effortless and the real name of the game will be the operating system and its interface. Apple has perfected that part of its business. Get ready for it. I'm ready. It will be a whole new generation of products to complain about. 

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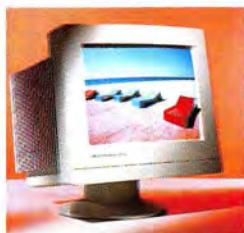
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